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down and hence increase the concentration of ACh in the brain (combatting the loss of ACh caused by the death of the cholinergic neurons). Acetylcholinesterase-inhibitors seemed to modestly moderate symptoms but do not alter the course of the underlying dementing process. Examples include:

Donepezil - (marketed as Aricept , Donezil & Donipezil) .

Rivastigmine - (marketed as Exelon) .

3- NMDA antagonists Recent evidence of the involvement of glutamatergic neuronal excitotoxicity causes Alzheimer's disease led to the development and introduction of memantine. Memantine is a novel NMDA receptor antagonist, and has been shown to be moderately clinically efficacious. Memantine is marketed as Ebixa

4- interventions والتدخلات and rehabilitation إعادة التأهيل strategies may be used as an adjunct to pharmacologic treatment

5- Vitamin E in doses below 400 IU was mentioned as having conflicting evidence in efficacy to prevent AD.

Schizophrenia

Definition

Schizophrenia is a mental disorder. It is difficult for a person to tell the difference between real and unreal experiences, to think logically, to have normal emotional responses to others, and to behave normally in social situations.

Psychological Disorders

Causes, incidence, and risk factors

Schizophrenia is a complex and puzzling ^{الحيرة} illness. Even the experts in the field are not exactly sure what causes it. Some doctors think that the brain may not be able to process information correctly.

Genetic factors appear to play a role, as people who have family members with schizophrenia may be more likely to get the disease themselves. Some researchers believe that events in a person's environment may trigger schizophrenia. For example, problems during intrauterine development (infection) and birth may increase the risk for developing schizophrenia later in life.

Psychological and social factors may also play some role in its development. However, the level of social and familial support appears to influence the course of illness and may be protective against relapse ^{المعاودة} .

There are 5 recognized types of schizophrenia: catatonic, paranoid, disorganized, undifferentiated, and residual. Features of schizophrenia include its typical onset before the age of 45, continuous presence of symptoms for 6 months or more, and deterioration from a prior level of social and occupational functioning.

People with schizophrenia may show a variety of symptoms. Usually the illness develops slowly over months or even years. At first, the symptoms may not be noticed. For

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example, people may feel tense, may have trouble sleeping, or have trouble concentrating. They become isolated and withdrawn, and they do not make or keep friends. As the illness progresses, psychotic symptoms develop:

- Delusions - false beliefs or thoughts with no basis in reality
- Hallucinations - hearing, seeing, or feeling things that are not there
- Disordered thinking - thoughts "jump" between completely unrelated topics (the person may talk nonsense)
- Catatonic behavior - bizarre غريب motor behavior marked by a decrease in reactivity to the environment, or hyperactivity that is unrelated to stimulus
- Flat affect - an appearance or mood that shows no emotion

No single characteristic is present in all types of schizophrenia. The risk factors include a family history of schizophrenia. Schizophrenia is thought to affect about 1% of the population worldwide.

Schizophrenia appears to occur in equal rates among men and women, but women have a later onset. For this reason, males tend to account for more than half of patients in services with high proportions of young adults. Although the onset of schizophrenia is typically in young adulthood, cases of the disorder with

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a late onset (over 45 years) are known.

Childhood-onset schizophrenia begins after the age of 5 and, in most cases, after relatively normal development. Childhood schizophrenia is rare and can be difficult to differentiate from other pervasive developmental disorders of childhood, such as autism التفرد.

Symptoms

Catatonic type:

- Motor disturbances
- Stupor
- Negativism
- Rigidity
- Agitation
- Inability to take care of personal needs
- Decreased sensitivity to painful stimulus

Paranoid type:

- Delusional thoughts of persecution or of a grandiose nature
- Anxiety
- Anger
- Violence
- Argumentativeness

Disorganized type:

- Incoherence (not understandable)
- Regressive behavior
- Flat affect
- Delusions
- Hallucinations
- Inappropriate laughter
- Repetitive mannerisms

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- Social withdrawal

Undifferentiated type: Patient may have symptoms of more than one subtype of schizophrenia.

Residual type: Prominent symptoms of the illness have abated, but some features - such as hallucinations and flat affect - may remain.

Signs and tests

Because other diseases can also cause symptoms of psychosis, psychiatrists should make the final diagnosis. The diagnosis is made based on a thorough psychiatric interview of the person and family members. As yet, there are no defining medical tests for schizophrenia. The following factors may suggest a schizophrenia diagnosis, but do not confirm it:

- Developmental background
- Genetic and family history
- Changes from level of functioning prior to illness
- Course of illness and duration of symptoms
- Response to pharmacological therapy

CT scans of the head and other imaging techniques may identify some changes associated with schizophrenia in the research literature and may rule out other neurophysiological disorders.

Treatment

Acute episode of schizophrenia :

- hospitalization is often required to

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promote safety, and to provide for the person's basic needs such as food, rest, and hygiene.

R / Neurazine amp. ٢-١ أمبول
بالعضل كل ٤ ساعات حتى يهدأ المريض ثم يكمل بالأقراص

R / Neurazine tab. ٢ قرص كل ٤ ساعات
حتى تضبط الأعراض ثم تخفض تدريجياً

- E.C.T in catatonic & hebephrenic types up to 6 ECTs (modified) daily or every other day .

بعض الأعراض تحتاج للمعالجة بالتنشج الهريائي
(يومياً أو يوم بعد يوم) لعدد ٦ جلسات

- On discharge from the hospital , patient should be prescribed :

R / Melleril retard 200 mg tab.
قرص كل مساء

R / Saffinace 5 mg tab.
Or : Stelazine 5 mg tab.
قرص ٣ مرات يومياً

R / Cogentin 2 mg tab.
Or : Akineton 2 mg tab.
Or : Parkinol 2 mg tab.
قرص ٢-٣ مرات يومياً

- Supportive psychotherapy :

Chronic episode

- Maintenance treatment to prevent relapses :

R / Modecate 25 mg vial.
Or : Fluanxol -depot amp.
Or : Haldol -decanoate 50 mg amp.
حقنة بالعضل كل ٢-٤ أسابيع

R / Melleril retard 200 mg tab.
Or : Neurazine tab. قرص كل مساء

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- **Antiparkinsonian drugs** used to avoid extrapyramidal symptoms (muscle contractions, problems of movement and gait, and feelings of restlessness) that result from using traditional antipsychotics :

R / Cogentin 2 mg tab.

Or : Akineton 2 mg tab.

قرص مرتين يوميا

- علاج نفسي و سلوكي مع إشراك الأسرة في علاج المريض

Depression

Definition

Depression may be described as feeling sad, blue, unhappy, miserable, or down in the dumps. Most of us feel this way at one time or another for short periods. But true clinical depression is a mood disorder in which feelings of sadness, loss, anger, or frustration interfere with everyday life for an extended time.

Signs and Symptoms

- 1- Persistent sadness
- 2- Irritability
- 3- Feelings of anxiety
- 4- Loss of interest or pleasure in life
- 5- Neglect of personal responsibility or personal care
- 6- Changes in eating habits
- 7- Changes in sleeping patterns

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- 8- Fatigue and loss of energy
- 9- Extreme mood changes
- 10- Feeling helpless, hopeless, or worthless
- 11- Physical symptoms (e.g., headaches, chronic pain)
- 12- Increased alcohol or drug use
- 13- Thoughts of death or suicide

The main types of depression include:

- 1- **Major depression** five or more symptoms listed above must be present for at least 2 weeks, but major depression tends to continue for at least 6 months. (Depression is classified as minor depression if less than five depressive symptoms are present for at least 2 weeks.)
- 2- **Dysthymia** -- a chronic, generally milder form of depression but lasts longer -- usually as long as two years.
- 3- **Atypical depression** -- depression accompanied by unusual symptoms, such as hallucinations (for example, hearing voices that are not really there) or delusions (irrational thoughts).

Other common forms of depression include:

- 1- Postpartum depression -- many women feel somewhat down after having a baby.

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- 2- Premenstrual dysphoric disorder (PMDD) -- depressive symptoms occur one week prior to menstruation.
- 3- Seasonal affective disorder (SAD) -- occurs during the fall-winter season and disappears during the spring-summer season. Likely to be due to lack of sunlight.

Depression may also occur with mania (known as manic-depression or bipolar disorder). In this condition, moods cycle between mania and depression.

Depression is more common in women than men and is especially common during the teen years.

Causes of Depression

- 1- Changes in brain chemistry are thought to be involved.
- 2- Family history and genetic inheritance have been linked to depression.
- 3- Stressful events in life, such as a serious loss, difficult relationship, job change or financial problem, can trigger an episode of depression.
- 4- Medical illness can affect emotions and cause depression.
- 5- Medications, including drugs used for heart conditions, cancer, hormone regulation

and high blood pressure, are linked to episodes of depression.

- 6- Drugs or alcohol or abuse of prescription medication can affect depression.

Treatment Options for Depression

Types of drugs (antidepressants) used to treat depression

- 1- Selective Serotonin Reuptake Inhibitors (SSRIs) increase the availability of the neurotransmitter serotonin in the brain.
- 2- Tricyclic antidepressants (TCAs) increase neurotransmitter serotonin and norepinephrine in the brain.
- 3- Heterocyclics act like tricyclic antidepressants in the brain, but were developed to offer fewer side effects.
- 4- Monoamine oxidase inhibitors (MAOIs) prevent the breakdown of serotonin and norepinephrine in the brain, increasing their availability as nerve receptor sites. These medications are not often used because of their potential side effects.

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Psychotherapy is available in several forms, including individual, group and family therapy. Therapists talk with patients to help identify unhealthy thought and behavioral patterns to address and modify.

Light therapy involves increased exposure to natural or artificial light. This treatment is normally used for patients who suffer from Seasonal Affective Disorder (SAD).

Electroconvulsive therapy (ECT) is a safe and effective treatment for severe and prolonged depression. In ECT, a patient is anesthetized and an electrical current is passed through the patient's brain to cause a seizure. ECT is given as a series of treatments, usually six to 10, and can be remarkably effective in treating depression that does not respond to medications.

Insomnia

R / Donormyl (Doxylamine) 15 mg tab. نصف - قرص كامل قبل النوم به ١٥ دقيقة
Or : Atrax tab. قرص ١-٢ مرة يوميا
Or : Dormival cap. ٢-٣ كبسولة جرعة واحدة قبل النوم

- يجب تنظيم ميعاد محدد للنوم كل يوم
- التقليل من تناول المشروبات المنبهة مثل القهوة والشاي و النسكافيه
- تناول المشروبات التي تساعد على الإسترخاء والنوم مثل اللبن
- أخذ حمام دافئ قبل النوم يساعد على الإسترخاء

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Respiratory Diseases

Pneumonia

Alternative names

Pneumonitis; Bronchopneumonia;
Community-acquired pneumonia

Definition

Pneumonia is an inflammation of the lungs caused by an infection. Many different organisms can cause it, including bacteria, viruses, and fungi.

Pneumonia can range from mild to severe, even fatal. The severity depends on the type of organism causing pneumonia, as well as age and underlying health.

Causes, incidence, and risk factors

Bacterial pneumonias tend to be the most serious and, in adults, the most common cause of pneumonia. The most common pneumonia-causing bacterium in adults is *Streptococcus pneumoniae* (pneumococcus).

Respiratory viruses are the most common causes of pneumonia in young children, peaking between the ages of 2 and 3. By school age, the bacterium *Mycoplasma pneumoniae* becomes more common.

In some people, particularly the elderly and those who are debilitated, bacterial pneumonia may follow influenza or even a common cold.

Many people contract pneumonia while staying in a hospital for other conditions. This tends to be more serious because the patient's immune system is often impaired due to the condition that initially required treatment. In addition, there is a greater possibility of infection with bacteria that are resistant to antibiotics.

Symptoms

The main symptoms of pneumonia are:

- Cough with greenish or yellow mucus; bloody sputum happens on occasion
- Fever with shaking chills
- Sharp or stabbing chest pain worsened by deep breathing or coughing
- Rapid, shallow breathing
- Shortness of breath

Additional symptoms include:

- Headache
- Excessive sweating and clammy skin
- Loss of appetite
- Excessive fatigue
- Confusion in older people

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Signs and tests

In pneumonia, breathing is hard & fast. Crackles صوت خشخشة are heard when listening to chest with a stethoscope. Other abnormal breathing sounds may also be heard through the stethoscope or via percussion (tapping النقر on chest wall).

The following tests may show signs of pneumonia:

- Chest x-ray
- Gram's stain and culture of sputum to look for the organism causing symptoms
- CBC to check white blood cell count; if high, this suggests bacterial infection
- Arterial blood gases to check how well blood is oxygenated
- CAT scan of the chest
- Pleural fluid culture if there is fluid in the space surrounding the lungs

Treatment

If the cause is bacterial, the goal is to cure the infection with antibiotics. If the cause is viral, antibiotics will NOT be effective. In some cases it is difficult to distinguish between viral and bacterial pneumonia, so antibiotics may be prescribed.

Many people can be treated at home with antibiotics. If the underlying disease is chronic, severe symptoms, or low oxygen levels, hospitalization may be required for intravenous antibiotics and oxygen therapy. Infants and the elderly are more commonly admitted for treatment of pneumonia.

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Home therapy :

- Drink plenty of fluids to help loosen secretions and bring up phlegm البلغم.
- Get lots of rest.
- Control fever with aspirin or acetaminophen. DO NOT give aspirin to children.

R / Unasyn 375 , 750 , 1500 Vial .
٥٠ - ١٠٠ مجم لكل كجم من وزن الجسم بالعضل أو الوريد يوميا .

OR / Rociphen 0.5 Or 1 gm.
٨٠ - ١٠٠ مجم لكل كجم من وزن الجسم بالوريد أو بالعضل يوميا .

OR / Garamycin (gentamicin) 20 , 40 , 80 mg Amp.
٥٠ - ٧٠ مجم لكل كجم من وزن الجسم يوميا مقسمة على جرعتين بالعضل أو الوريد .

OR / Cefotax 0.5 or 1 gm . vial .
٥٠ - ١٠٠ مجم لكل كجم بالعضل أو بالوريد مقسمة على جرعتين يوميا .

R / Avipect syrup.
or : Bronchophan Syrup.
ملعقة ٣ مرات يوميا

R / Brufen tab. & Syrup.
قرص أو ملعقة ٣ مرات يوميا

R / Vegaskine Ped. Supp. (For children)
لبوسة كل ١٢ ساعة

In the hospitalization , respiratory treatments to remove secretions may be necessary. Occasionally, steroid medications may be used to reduce wheezing if there is an underlying lung disease.

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Prevention

- Washing hands frequently, especially after blowing nose, going to the bathroom, diapering, and before eating or preparing foods.
- stopping smoke. Tobacco damages lung's ability to ward off infection.
- Wearing a mask when cleaning dusty or moldy areas

Vaccines can help prevent pneumonia in children, the elderly, and people with diabetes, asthma, emphysema, HIV, cancer, or other chronic conditions:

- Pneumococcal vaccine prevents *Streptococcus pneumoniae*.
- Flu vaccine prevents pneumonia and other infections caused by influenza viruses. It must be given yearly to protect against new viral strains.
- Hib vaccine prevents pneumonia in children from *Haemophilus influenzae* type b.

Taking deep breaths may help prevent pneumonia if patient is in the hospital -- for example, while recovering from surgery. Often, a breathing device will be given to patient to assist in deep breathing.

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Pneumothorax

Alternative names Air around the lung; Air outside the lung

Definition A pneumothorax is collection of air or gas in the space surrounding the lungs.

Causes, incidence, and risk factors

Pneumothorax may result from chest trauma, excessive pressure on the lungs, or an underlying lung disease such as COPD, asthma, cystic fibrosis, tuberculosis, and whooping cough. In some cases, the cause is unclear.

Symptoms

- Sudden sharp chest pain, made worse by a deep breath or a cough
- Shortness of breath
- Chest tightness
- Easy fatigue
- Rapid heart rate
- Bluish color of the skin caused by lack of oxygen

Note: Symptoms may begin during rest or sleep.

Additional symptoms that may be associated with this disease:

- Nasal flaring
- Anxiety, stress, and tension
- Hypotension (low blood pressure)

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Signs and tests

Stethoscope examination of the chest reveals decreased or absent breath sounds on the affected side.

Tests include:

- Chest x-ray to determine presence of air outside the lung
- Arterial blood gases

Treatment

Small pneumothoraces may go away on their own.

Larger pneumothoraces require the removal of air from around the lung. A chest tube (chest tube insertion) placed between the ribs into space surrounding the lungs helps clear the air and allows the lung to re-expand. This may take several days (the chest tube is left in place). The patient must stay in the hospital while the chest tube is in place.

Supplemental oxygen may be needed to help air around the lung be reabsorbed more quickly.

Surgery may be needed to prevent recurrent episodes.

Prevention There is no known prevention, other than to decrease risk by stopping smoking.

Bronchitis

Signs and symptoms

- Cough with yellowish-gray or green mucus (sputum) .
- Mucus that isn't white or clear usually means there's a secondary infection.
- Soreness and a feeling of constriction or burning in chest
- Sore throat
- Congestion
- Breathlessness
- Wheezing
- Slight fever and chills
- Overall malaise

Causes

- viruses that cause colds often cause acute bronchitis.
- pollutants such as household cleaners and smog.
- Smoking .
- Bronchitis can also occur when acids from stomach consistently back up into esophagus, a condition known as gastroesophageal reflux disease, or GERD.
- Exposure to certain irritants on the job may develop occupational bronchitis which may be dry (nonproductive).

Acute bronchitis : Occurs in short time & cough longed for few days only .

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Chronic bronchitis : - inflammation and thickening of the lining of bronchial tubes become permanent , shortness of breath , continual cough for at least three months a year, large amounts of mucus

In some people, chronic inflammation of the airways leads to asthma.

Screening and Diagnosis

- Listening of chest with a stethoscope.
- **Chest X-ray**
- **Sputum culture** : a test that checks for the presence of bacteria in sputum .
- **Pulmonary function test (PFT)** : that checks for signs of asthma or emphysema. by a device called a spirometer, which measures the volume of air in lungs after taken a deep breath and blown it out.

Complications

- Pneumonia , Bronchial asthma .
- Older adults, infants, smokers and people with chronic respiratory disorders or heart problems are at greatest risk of this complication.

Treatment

Acute bronchitis :

For cough ::

R / Sinecod syrup.

Or : Tussilar Syrup. (in dry cough)
ملعقة ٣ مرات يوميا

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R / Ultrasolv Syrup. (in productive cough)
ملعقة ٣ مرات يوميا

For pain & fever :

R / Abimol Syrup. (for children)

Or : Paramol 500 mg. Tab. (for adult) .

ملعقة أو قرص ٣ مرات يوميا

For Breathlessness & wheezing :

R / Aironyl Syrup. ملعقة ٣ مرات يوميا

For secondary infection :

R / Bactiolor 500 mg Cap.(in adult)
250 mg Syrup. (in children) . قرص
أو ملعقة كل ١٢ ساعة لمدة ٥ - ١٠ أيام

Chronic bronchitis :

R / Flumox 500 Cap. , 250 mg
Syrup. كبسولة أو ملعقة كل ٨ ساعات

R/ Bronchophan Syrup.

ملعقة ٣ مرات يوميا

R / Minophylline Supp.

لبوسنة كل ١٢ ساعة

N.B. some doctors prefer injectable antibiotics for secondary infection .

In severe cases :

Oxygen inhalation , corticosteroid & theophylline injection may be needed .

Prevention

- Avoid smoking and exposure to secondhand smoke.
- Get an annual flu vaccine.
Many cases of acute bronchitis result from influenza. Getting a yearly flu vaccine can help protect from both bronchitis and the flu.

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Emphysema

Chronic obstructive pulmonary disease (COPD) is a general term for a group of diseases includes chronic bronchitis, asthma and emphysema.

Unlike asthma, which occurs when the muscles in airways tighten, emphysema causes a loss of elasticity in the walls of the small air sacs in lungs. Eventually, the walls stretch and break, creating larger, less efficient air sacs that aren't able to handle the normal exchange of oxygen and carbon dioxide.

Signs and symptoms

- Shortness of breath
- A reduced capacity for physical activity
- Chronic, mild cough with sputum or phlegm.
- Loss of appetite and weight loss.
- Fatigue.

What happens in emphysema ?

In emphysema, inflammation destroys these fragile walls of the air sacs, causing them to lose their elasticity. As a result, the bronchioles collapse, and air becomes trapped in the air sacs, which overstretches them and interferes with the ability to exhale (hyperinflation).

In time, this overstretching may cause several air sacs to rupture, forming one larger air space instead of many small ones. Because the larger, less-elastic sacs aren't able to force air completely out of lungs

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when patient exhales, he has to breathe harder to take in enough oxygen and to eliminate carbon dioxide.

The process works something like this: Normally, the person exhales in two ways, actively and passively. When he exerts himself and needs more oxygen, his chest muscles contract, forcing air out rapidly. On the other hand, when he sits quietly, his diaphragm contracts and his chest muscles expand to take air in, but his muscles don't actively contract to let the air out. Instead, the elastic tissue around his air sacs contracts, and his lungs passively shrink.

But if he has emphysema, many of these elastic fibers have been destroyed, and he must consciously force air out of his lungs. The forced exhalation compresses many of his small airways, making expelling air even more difficult.

Causes

- Smoking

Cigarette smoke is by far the most common cause of emphysema. The damage begins when tobacco smoke temporarily paralyzes the microscopic hairs (cilia) that line the bronchial tubes. Normally, these hairs sweep irritants and germs out of airways. But when smoke interferes with this sweeping movement, irritants remain in the bronchial tubes and infiltrate the alveoli, inflaming the tissue and eventually breaking down elastic fibers.

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Protein deficiency plays a role. In a small percentage of people, emphysema results from low levels of a protein called alpha-1-antitrypsin (AA_t), which protects the elastic structures in lungs from the destructive effects of certain enzymes. A lack of AA_t can lead to progressive lung damage that eventually results in emphysema.

Screening and Diagnosis

- **Pulmonary function tests (PFTs).**
- **Chest X-ray.**
- **Arterial blood gases (ABG) analysis** to measure how well lungs transfer oxygen to bloodstream and how effectively they remove carbon dioxide.
- **Pulse oximetry.** This test involves use of a small device that attaches to fingertip طرف الإصبع. The oximeter measures the amount of oxygen in blood differently from the way it's measured in blood gas analysis. To help determine whether patient needs supplemental oxygen, the test may be performed at rest, during exercise and overnight.
- **Sputum examination.** Analysis of cells in sputum can help determine the cause of some lung problems.
- **Computerized tomography (CT) scan.** A CT scan allows to see organs in two-dimensional

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images or "slices." Split-second computer processing creates these images as a series of very thin X-ray beams are passed through the body. A CT scan can detect emphysema sooner than an X-ray can, but it can't assess the severity of emphysema as accurately as can a pulmonary function

Treatment : Similar to that outlined under chronic bronchitis .

Bronchial Asthma

Description : Asthma is a **chronic** disease of the respiratory system in which the airway occasionally constricts, becomes inflamed, and with excessive amounts of mucus, often in response to one or more triggers. E.g. exposure to an environmental stimulant (or allergen), cold air, exercise or exertion, or emotional stress. In children, the most common triggers are viral illnesses such as those that cause the common cold.

✎ This airway narrowing causes symptoms such as wheezing, shortness of breath, chest tightness, and coughing, which respond to bronchodilators. **Between** episodes, most patients feel fine.

Term Definition: The word asthma is derived from the Greek aazein, meaning "sharp breath."

Signs and symptoms :

An acute exacerbation تفاقم of asthma is referred to as an asthma attack.

➤ The clinical hallmarks of an attack are shortness of breath = dyspnea and either wheezing

✎ some victims present primarily with coughing, and in the late stages of an attack, air motion may be so impaired that no wheezing may be heard. When present the cough may sometimes produce clear sputum.

Signs of an asthmatic episode or asthma attack are either wheezing, rapid breathing (tachypnea), prolonged expiration, a rapid heart rate (tachycardia), rhonchous lung sounds (audible through a stethoscope), and over-inflation of the chest.

☞ During very severe attacks, an asthma sufferer **المُعاني** can turn blue from lack of oxygen, and can experience chest pain or even loss of consciousness. **فقدان الوعي** Severe asthma attacks may lead to respiratory arrest and death.

Diagnosis

✎ Asthma is strongly suspected if a patient suffers from eczema or other allergic conditions

✎ Diagnosis in children is based on a careful compilation and analysis of the patient's medical history and subsequent improvement with an inhaled bronchodilator medication.

✎ In adults, diagnosis can be made with a peak flow meter (which tests airway restriction), looking at both the diurnal **النهارى** variation and any reversibility following inhaled bronchodilator medication.

✎ Testing peak flow at rest (or baseline) and after exercise can be helpful, especially in young asthmatics that may experience only exercise-induced asthma.

Differential Diagnosis

1- Before diagnosing someone as asthmatic, alternative possibilities should be considered. A physician taking a history should check whether the patient is using any known **bronchoconstrictors** (that cause narrowing of the airways, e.g., certain anti-inflammatory agents or beta-blockers).

2- **Chronic obstructive pulmonary disease**, which closely resembles asthma, is correlated with more exposure to cigarette smoke, an older patient, less symptom reversibility after bronchodilator administration (as measured by spirometry)

✎ Asthma is categories :

- A- Mild intermittent
- B- mild persistent
- C- moderate persistent
- D- severe persistent.

The diagnosis of "severe persistent asthma" occurs when symptoms are continual with frequent exacerbations **تتفاقم بشدة** and frequent nighttime symptoms, result in limited physical activity and when lung function as measured by PEV or FEV1 tests is less than 60% predicted with PEF.

3- There is no cure for asthma. Doctors have only found ways to prevent attacks and relieve the symptoms such as tightness of the chest and trouble breathing.

➤ The airways of asthmatics are "hypersensitive" to certain triggers, also known as stimuli.

There are several types of stimuli :

1- allergenic air pollution, from nature which include waste from common

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household insects, such as the house dust mite and cockroach, grass pollen, mould spores and pet epithelial cells.

2- Medications, including aspirin and beta blockers

3- various industrial compounds and other chemicals, notably sulfites; chlorinated swimming pools ...etc

4- Early childhood infections, especially viral respiratory infections. However, persons of any age can have asthma triggered by colds and other respiratory infections even though their normal stimuli might be from another category (e.g. pollen) and absent at the time of infection.

❗ **Did you know that > 80% of asthma attacks in adults and 60% in children are caused by respiratory viruses.**

exercise, the effects of which differ somewhat from those of the

☞ Many studies have linked asthma, bronchitis, acute respiratory illnesses to air quality experienced by children.

5- allergenic indoor air pollution from newsprint & other literature

Bronchial inflammation

The mechanisms behind allergic asthma is inhaled allergens that find their way to the inner airways are ingested by a type of cell known as **antigen presenting cells**, or APCs. ➤ In most people, the immune cells (TH0 cells) "**check**" and **usually ignore** the allergen molecules. In asthmatics, these cells transform into a different type of cell (TH2), **for reasons that are not well understood**. The resultant TH2 cells activate an important arm of the immune system, known as the **humoral immune system**. The humoral immune system

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produces antibodies against the inhaled allergen. **Later**, when an asthmatic inhales the same allergen, these antibodies "**recognize**" it and activate a humoral response. Inflammation results: chemicals e.g. (histamine & Leukotriens) are produced that **cause the airways to constrict** and release more mucus, and the cell-mediated arm of the immune system is activated.

Treatment :

1- The most effective treatment for asthma is identifying triggers معرفة الانتجين المسبب للحساسية , such as pets الحيوانات الأليفة or aspirin, and limiting or eliminating exposure to them.

2- Desensitization to allergens has been shown to be a treatment option for certain patients. حقنة مخففه من الانتجين المسبب للحساسية تحضر خصيصاً لكل مريض تمنع تحسسه من الانتجين

3- Smoking cessation توقف and avoidance of second-hand smoke التجنيد السلبي is strongly encouraged in asthmatics.

4- Bronchodilators are recommended for short-term relief in all patients.

5- For those with mild persistent disease (more than two attacks a week), low-dose inhaled glucocorticoids or alternatively, an oral leukotriene modifier, a mast-cell stabilizer, or theophylline may be administered.

6- For those who suffer daily attacks, a higher dose of glucocorticoid in conjunction with a long-acting inhaled β -2 agonist may be prescribed ➤➤ alternatively; a leukotriene modifier or theophylline may substitute for the β -2 agonist. In severe asthmatics, oral glucocorticoids may be added to

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these treatments during severe attacks.

7- Symptomatic control of episodes of wheezing and shortness of breath is generally achieved with fast-acting bronchodilators.

➤➤ Short-acting, selective beta2-adrenoceptor agonists, such as salbutamol, terbutaline.

➤➤ Older, less selective adrenergic agonists, such as inhaled epinephrine and ephedrine tablets, are available

➤➤ ipratropium bromide may be used instead. They have no cardiac side effects and thus can be used in patients with heart disease {e.g.

atrovent & combivent}

⚠ **Did you know that >** Nebulizers may be helpful to some patients experiencing a severe attack. Such patients may not be able to inhale deeply.

Prevention medication

such as an inhaled corticosteroid, which helps to suppress inflammation and reduces the swelling of the lining of the airways, in anyone who has frequent (greater than twice a week)

Preventive agents {to guard against future attack include :

1- Inhaled glucocorticoids (have low side effects) e.g. beclomethasone, budesonide, fluticasone, mometasone, and triamcinolone).

2- Leukotriene modifiers (montelukast, zafirlukast)

3- Antimuscarinics/anticholinergics (ipratropium)

4- Methylxanthines (theophylline and aminophylline), which are sometimes considered if sufficient control cannot be achieved with inhaled glucocorticoids and long-acting β -agonists alone.

Respiratory disorders

5- Antihistamines, often used to treat allergic symptoms

6- Long-acting β 2-agonists e.g.

Serevent (salmeterol), a long-acting bronchodilator.

➤➤ long-acting beta2-adrenoceptor agonists include salmeterol, formoterol {Foradil & Oxis}, bambuterol {Bambic}

➤➤ Combinations of inhaled steroids and long-acting bronchodilators e.g. Seretide

Emergency treatment

➤➤ oxygen to alleviate the hypoxia

➤➤ nebulized salbutamol or terbutaline (short-acting beta-2-agonists)

➤➤ methylprednisolone, dexamethasone, or hydrocortisone) other bronchodilators that are occasionally effective when the usual drugs fail:

➤➤ nonspecific beta-agonists, injected or inhaled e.g. epinephrine

➤➤ theophylline, aminophylline

➤➤ inhalation anesthetics that have a bronchodilatory effect isoflurane, halothane, enflurane);

Prognosis

The prognosis for asthmatics is good, especially for children with mild disease. For asthmatics diagnosed during childhood, 54% will no longer carry the diagnosis after a decade.

➤➤ For those who continue to suffer from mild symptoms, corticosteroids can help most to live their lives with few disabilities.

Chapter-9

Pulmonary Tuberculosis

السل أو الدرن الرئوي

What is tuberculosis?

Tuberculosis also called TB, is an infection caused by a bacteria (a germ). Tuberculosis usually affects the lungs, but it can spread to the kidneys, bones, spine, brain and other parts of the body.

How does doctor check for tuberculosis?

The most commonly used method to check for tuberculosis is the PPD skin test. If patient has a positive PPD, it means he has been exposed to a person who has tuberculosis and he is now infected with the bacteria that causes the disease.

After he has a positive PPD skin test, he must have a chest x-ray and a physical exam to find it whether has active disease or are contagious (able to spread the disease).

It usually takes only a few days to tell whether he is contagious. Most people with a positive skin test aren't contagious.

If I have a positive PPD test, do I have tuberculosis?

Not necessarily. A person can be infected with the bacteria that causes tuberculosis but not actually have tuberculosis disease. Many people are infected with the bacteria that causes tuberculosis, but only a few of these people (about 10%) go on to develop the disease. People who do have the disease are said to have "active" tuberculosis.

Respiratory disorders

Healthy people who get infected with the tuberculosis bacteria are able to fight off the infection and do not get tuberculosis disease. The bacteria is dormant (inactive) in their lungs. If the body is not able to fight off the infection and the bacteria continues to grow, active tuberculosis develops.

Symptoms :

- Cough .
- Lose weight
- fever or break out in a sweat during the night (called "night sweats").
- Difficult breathing

Treatment :

If patient has active TB, 4 medicines may be taken :

- Isoniazid
- Rifampin (one brand name: Rifadin)
- Ethambutol (brand name: Myambutol)
- Pyrazinamide

Chapetr -10 Rheumatology

Arthritis

☞ is a group of conditions where there is damage caused to the joints of the body.

Types of arthritis: There are many forms of arthritis, each of which has a different cause.

1- Osteoarthritis also known as degenerative arthritis or degenerative joint disease .

2- Rheumatoid arthritis and psoriatic arthritis are autoimmune diseases in which the body is attacking itself.

3- Gouty arthritis is caused by deposition of uric acid crystals in the joint that results in subsequent inflammation.

Osteoarthritis = OA

Osteoarthritis also known as degenerative arthritis or degenerative joint disease, and sometimes referred to as "arthrosis" or "osteoarthrosis" or in more colloquial terms "wear and tear"), is a condition in which low-grade inflammation results in pain in the joints, caused by wearing of the cartilage that covers and acts as a cushion inside joints. As the bone surfaces become less well protected by cartilage, the patient experiences pain upon weight bearing, including walking and standing. Due to decreased movement because of the

pain, regional muscles may atrophy, and ligaments may become more lax. OA is the most common form of arthritis.

Signs and symptoms

The main symptom is chronic pain, causing loss of mobility and often stiffness. "Pain" is generally described as a sharp ache, or a burning sensation in the associated muscles and tendons. OA can cause a crackling noise (called "crepitus") when the affected joint is moved or touched, and patients may experience muscle spasm and contractions in the tendons. Occasionally, the joints may also be filled with fluid.

- OA commonly affects the hand, feet, spine, and the large weight-bearing joints, such as the hips and knees, although in theory, any joint in the body can be affected. As OA progresses, the affected joints appear larger, are stiff and painful, and usually feel worse, the more they are used throughout the day, thus distinguishing it from rheumatoid arthritis.

Causes of osteoarthritis

Osteoarthritis often affects multiple members of the same family, suggesting that there is hereditary susceptibility to this condition. Osteoarthritis may be divided into two types:

Primary osteoarthritis

This type of OA is a chronic degenerative disorder related to but

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not caused by aging, as there are people well into their nineties who have no clinical or functional signs of the disease. As a person ages, the water content of the cartilage decreases due to a reduced proteoglycan content, thus causing the cartilage to be less resilient مرونة. Without the protective effects of the proteoglycans, the collagen fibers of the cartilage can become susceptible to degradation and thus exacerbate the degeneration. Inflammation of the surrounding joint capsule can also occur, though often mild (compared to that which occurs in rheumatoid arthritis). This can happen as breakdown products from the cartilage are released into the synovial space, and the cells lining the joint attempt to remove them.

Secondary osteoarthritis

This type of OA is caused by other factors or diseases but the resulting pathology is the same as for primary OA .

Diagnosis

Diagnosis is normally done through x-rays. This is possible because loss of cartilage, subchondral ("below cartilage") sclerosis, subchondral cysts, the narrowing of the joint space between adjacent bones, and bone spur formation (osteophytes) show up clearly in x-rays. Plain films.

Treatment :

R / Indomethacin Supp.

لبوسة عند اللزوم

Or : Celebrex 200 Cap.

كبسولة كل ١٢ ساعة

Or : Indocid Cap.

٢-١ كبسولة بعد الأكل ٣ مرات يوميا

R/ Voltaren oint . دهان ٣ مرات يوميا

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R / Piascledine 300 mg . Cap.

كبسولة واحدة يوميا لمدة ٦-٣ شهور

Or : Glucosamine tab.

كبسولة ٣ مرات يوميا لمدة ٣ - ٦ شهور

- Reduce weight in obese patients .

Notes :

- Dietary Supplements useful for treating OA include:

Antioxidants, including vitamins C .

- Chondroitin sulphate improves symptoms of OA, and delays its progression.

- Glucosamine: is used by the body to make some of the components of cartilage and synovial fluid.

Supplemental glucosamine may improve symptoms of OA and delay its progression e.g.

- Methylsulfonylmethane (MSM) : significantly reduced pain and improved physical functioning in OA patients without major adverse events

- vitamins B9 (folate) and B12 (cobalamin) taken in large doses significantly reduced OA hand pain, presumably by reducing systemic inflammation .

- Vitamin D deficiency has been reported in patients with OA, and supplementation with Vitamin D3 is recommended for pain relief

- NSAIDs are usually prescribed which can reduce both the pain and inflammation quite effectively. These include ((diclofenac, ibuprofen and naproxen. High doses are often required.))

- Another type of NSAID, COX-2 selective inhibitors (e.g. celecoxib) reduce this risk substantially. **These latter NSAIDs carry an elevated risk**

for cardiovascular disease . , and some have now been withdrawn from the market. Another medication.

- Application of heat — often moist heat — eases inflammation and swelling in the joints, and can help improve circulation, which has a healing effect on the local area.

- **Topical treatments** : Some NSAIDs are available for topical use (e.g. ibuprofen and diclofenac) and may improve symptoms without having systemic side-effects.

- Severe pain in specific joints can be treated with local lidocaine injections or similar local anaesthetics, and glucocorticoids (such as hydrocortisone). Corticosteroids (cortisone and similar agents) may temporarily reduce the pain.

- If the above management is ineffective, joint replacement surgery may be required. Individuals with very painful OA joints may require surgery such as fragment removal, repositioning bones, or fusing bone to increase stability and reduce pain. For severe pain, narcotic pain relievers such as tramadol, and eventually opioids (hydrocodine, or morphine) may be necessary; these should be reserved for very severe cases, and are **rarely** medically necessary for chronic pain.

Rheumatoid arthritis = RA

The name is derived from the Greek rheumatosis meaning "flowing", the suffix -oid meaning "in the shape of", arthr meaning "joint" and the suffix -

itis, a "condition involving inflammation".

Rheumatoid arthritis (RA) is traditionally considered a chronic, inflammatory autoimmune disorder that **causes the immune system to attack the joints**. It is a painful inflammatory condition, which can lead to substantial loss of mobility **عدم المقدرة على الحركة** due to pain and joint destruction.

Symptomes :

1- The symptoms that distinguish **rheumatoid arthritis** from other forms of arthritis are inflammation and soft-tissue swelling of many joints at the same time = (polyarthritis).

2- The joints are usually affected initially asymmetrically **بدون تساوى** and then in a symmetrical fashion as the disease progresses.

3- there is stiffness of all joints in the morning that lasts over 1 hour.

4- Thus, the pain of rheumatoid arthritis is usually worse in the morning compared to the classic pain of osteoarthritis where the pain worsens over the day as the joints are used.

5- As the pathology progresses the inflammatory activity leads to erosion **تآكل** and destruction of the joint surface, which impairs their range of movement and leads to deformity. The fingers are typically deviated towards the little finger , and can assume unnatural shapes.

6- **Cutaneous manifestations** is most characteristic of rheumatoid arthritis is the rheumatoid nodule. The initial pathologic process in nodule formation is unknown but is thought to be related to small-vessel inflammation.

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Extra-articular (elsewhere)

7- Dermatological Subcutaneous nodules on extensor ^{العضلة الباسطة} surfaces, such as the elbows, are often present.

8- Pulmonary Fibrosis may occur spontaneously or as a consequence of therapy (for example methotrexate).

9- Autoimmune disorders, resulting in nail fold infarcts, neuropathies and nephropathies.

10- Cardiovascular Pericarditis, endocarditis, left ventricular failure, valvulitis and fibrosis.
Ocular

Diagnosis :

1- Morning stiffness of >1 hour.
Arthritis and soft-tissue swelling of >3 of 14 joints/joint groups
Arthritis of hand joints

2- Symmetric arthritis

3- Subcutaneous nodules in specific places

4- Rheumatoid factor at a level above the 95th percentile

5- Radiological changes suggestive of joint erosion

☞ At least four criteria have to be met to establish the diagnosis, although many patients are treated despite not meeting the criteria.

6- Blood tests

rheumatoid factor = RF= a specific antibody),

☞ A negative RF does not rule out ^{لا} RA ^{يمنع وجود}

During the first year of illness, rheumatoid factor is frequently negative = seronegative

☞ 80% of patients convert to seropositive status.

N.B. RF is also seen in approximately 10% of the healthy

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population, therefore the test is not very specific.

7- a new serological test has been developed in recent years, which tests for the presence of so called anti-citrullinated protein (ACP) antibodies. Like RF, this test can detect approximately 80% of all RA patients ☞ ACP antibodies can be detected in early stages of the disease, Currently, most common test for ACP antibodies is the anti-CCP (cyclic citrullinated peptide) test.

8- several other blood tests are done to allow for other causes of arthritis, such as lupus erythematosus ^{داء الذئبة}. The erythrocyte sedimentation rate (ESR), C-reactive protein, full blood count, renal function, liver enzymes are performed .

Treatment :

- راحة تامة في السرير

- Nonsteroidal anti-inflammatory drugs (NSAIDs) :

R / Voltaren Amp.

Or : Cataflam Amp.

أمبول بالعضل يوميا

R / Indocid cap.

Or : Brufen Tab.

كبسولة أو قرص بعد الأكل ٣ مرات يوميا

- Disease modifying anti-rheumatic drugs (DMARDs) :

R / Artamine 250 mg Cap. (D-penicillamine)

كبسولة يوميا لمدة شهر ثم كبسولة مرتين يوميا لمدة شهر ثم كبسولة ٣ مرات يوميا لمدة شهر ثم كبسولة واحدة يوميا باستمرار

Or : Myocrisine amp. 50 mg (Gold therapy)

١٠ مجم بالعضل في البداية ثم ٢٥ مجم بالعضل بعد أسبوع ثم ٥٠ مجم بالعضل أسبوعيا حتى يكمل ١ جم ثم ٢٠ مجم بالعضل كل شهر

- Corticosteroids :

R / Synacthen-depot Amp .

حقنة بالعضل يوميا أو يوم بعد يوم حتى تتحسن الحالة

Or : Hostacortin Tab.

قرص مرتين يوميا

Notes : Treatment divided into :-

- 1- disease-modifying antirheumatic drugs (DMARDs **Look types below**).
- 2- anti-inflammatory agents and analgesics improve pain and stiffness but do not prevent joint damage or slow the disease progression..

☞ DMARDs have been found to produce durable remissions and delay disease progression. In particular they prevent bone and joint damage from occurring secondary to the uncontrolled inflammation. **This is important** as damage is usually irreversible.

☞ permanent damage to the joints occurs at a very early stage in the disease.

☞ Ultrasound and MRI are more sensitive methods of imaging the joints and have demonstrated that joint damage occurs much earlier and in more patients than was previously thought **أكثر مما كان يعتقد سابقاً** . Patients will often have erosions detectable by ultrasound .

☞ Starting DMARDs early is beneficial as well as prevention of structural joint damage.

☞ Delaying therapy for as little as a few months after the onset of symptoms can result in worse outcomes in the long term.

Disease modifying anti-rheumatic drugs (DMARDs)

The most important DMARDs are xenobiotic agents .

Xenobiotics : include: azathioprine cyclosporine A, D-penicillamine , hydroxychloroquine , leflunomide, methotrexate sulfasalazine (SSZ)

☞ **common adverse effects of xenobiotics are liver and bone marrow toxicity**

☞ Hydroxychloroquine (Plaquenil & Hydroquine) may cause ocular toxicity, although this is rare, and because hydroxychloroquine does not affect the bone marrow or liver it is often considered to be the DMARD with the least toxicity. Unfortunately hydroxychloroquine is not very potent, and for most patients hydroxychloroquine alone is insufficient to control symptoms.

☞ **Methotrexate** is the most important and useful DMARD. This is because it is the most effective not only in controlling the pain and stiffness of arthritis, but also in preventing the bone damage that can result from uncontrolled inflammation.

☞ **corticosteroids**, effective at reducing pain and stiffness, are less effective at retarding bone damage.

Anti-inflammatory agents and analgesics

A- Anti-inflammatory agents include: glucocorticoids

B- Non-steroidal anti-inflammatory drug (NSAIDs, act as analgesics)

C- Analgesics include: acetaminophen, opiates , lidocaine topical

Prognosis Some patients have mild short-term symptoms, but in most

the disease is progressive for life. Around 20%-30% will have subcutaneous nodules (known as rheumatoid nodules); this is associated with a poor prognosis.

☞ **Disability** Daily living activities are impaired in most patients.

After 5 years of disease, approximately 33% of patients will not be working

After 10 years, approximately half will have substantial functional disability.

Mortality Life expectancy for patients with RA is shortened by 5-10 years, although those who respond to therapy may have lower mortality rates.

Hyperuricemia (Gout)

Gout (also called metabolic arthritis) is a disease due to an inborn disorder of the uric acid metabolism. ☞ monosodium urate crystals are deposited on the articular cartilage of joints and in the particular tissue like tendons. This provokes يثير an inflammatory reaction of these tissues.

☞ Elevated blood levels of uric acid can also result in uric kidney stones .

Pathogenesis

Although the exact cause of gout is not known, it is thought to be linked to defects in purine metabolism. Purine is an organic compound commonly found in the body and is metabolized by the body into uric acid. People with primary gout have either an increased production of uric

acid or an impaired excretion of uric acid, or a combination of both.

Signs and symptoms

sudden pain, swelling, redness, warmth and stiffness in the joint.

☞ The patient usually suffers from two sources of pain. The crystals inside the joint cause intense pain .

☞ The inflammation of the tissues around the joint also causes the skin to be swollen, tender and sore if it is even slightly touched. For example, a blanket draping لف البطانية over the affected area could cause extreme pain.

Places of the disease Gout usually attacks the big toe (approximately 75% of first attacks), however it can also affect other joints such as the ankle , heel الكعب , instep مشط القدم , knee, wrist, elbow, fingers, and spine العمود الفقري .

Diagnosis

Hyperuricemia is a common feature; however, urate levels are not always raised. **Hyperuricemia** is defined as a plasma urate (uric acid) level greater than 420 $\mu\text{mol/L}$ (7.0 mg/dL) in males (the level is around 380 $\mu\text{mol/L}$ in females);

☞ High uric acid level does not necessarily mean a person will develop gout.

☞ lacking in purine-neutralising foods, such as berries, as well as other specific fruit and vegetables

☞ Gout can also develop as co-morbidity of other diseases, including polycythaemia, leukaemia, intake of cytotoxics, obesity, diabetes, hypertension, renal disorders, and hemolytic anemia.

☞ Diuretics (particularly **thiazide diuretics**) have been blamed for **precipitating** attacks of gout.

Stages of gout Gout has four distinct stages:

- 1- **asymptomatic** ➤ plasma uric acid level increases, but there are no symptoms
- 2- **acute** is The first attack of gout marks the second or acute stage
- 3- **intercritical** ➤ After the initial attack, the person enters the intercritical stage or symptom-free interval that may last months or even years
- 4- **chronic** ➤ gout attacks become frequent and become polyarticular (affecting multiple joints at one time).

Treatment :

- **Avoid high-purine foods .**

ممنوع تناول اللحوم و الكلى و الكبد و الخميرة و المشروبات الكحولية و البقوليات و السبانخ و الكرنب و عيش الغراب

- **Plenty of fluids .** شرب السوائل بكثرة

- **NSAIDs :**

R / Indocid cap.

كبسولة ٣ مرات يوميا بعد الأكل

Or : Dexason tab . قرص مرتين يوميا

- **uricosuric :**

R / Zyloric 100 mg or 300 mg.

Or : No-uric 100 mg or 300 mg

١٠٠ مجم ٣ مرات يوميا أو ٣٠٠ مجم ٣

مرات يوميا

- R / Urosolvine eff . sachets .

Or : Urivin eff. Sachets

كيس على نصف كوب ماء ٣ مرات

يوميا

Or : Colmiditen tab.

قرص ٣ مرات يوميا

Notes :

- 1- first line treatment should be pain relief. Once the diagnosis has been confirmed, the drugs of choice are indomethacin, other nonsteroidal anti-inflammatory drugs (NSAIDs).
- 2- Colchicine was **previously** the drug of choice in acute attacks of gout. It impairs the motility of granulocytes and can prevent the inflammatory phenomena that initiate an attack of gout. Colchicine should be taken within the first 12 hours of the attack and usually relieves the pain within 48 hours.
- 3- NSAIDs such as ibuprofen can reduce the pain and inflammation slightly
- 4- Ice may be applied for 20-30 minutes several times a day. There are concerns that uric acid crystallization is accelerated by low

Prevention

Long term treatment (in frequent attacks) is antihyperuricemic therapy.

5 - Because the body metabolizes purines into uric acid, a maintained, low-purine diet can help lower the plasma urate level. Avoiding alcohol, high-purine foods, such as **meat, fish, dry beans** (also **lentils** العدس and **peas** البازلاء), scallops, Sardine, prawns, mushrooms, **spinach**, and **cauliflower** القرنابيط can lower plasma urate levels.

6- In addition, consuming purine-neutralizing foods, such as **fresh fruits** (especially **cherries** and **strawberries**) and most fresh vegetables, diluted celery juice الكرفس, distilled water, and **B-complex** and **C vitamins** can also help lower plasma urate levels.

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7- A strong natural cure is a berry extract التوت supplement consisting of bilberry, blueberry العناب or cherry الكرز extracts.

✎ The anthocyanins which give the berries their blue and purple hues شكله البنفسجي, after entering the body, turn into powerful anti-inflammatories. These might be an especially preferable option to transplant patients, who frequently suffer gout due to increased toxicity and strain on the kidneys due to their immunosuppressant medication.

8 - Allopurinol, a xanthine oxidase inhibitor, which directly reduces the production of uric acid.

✎ Allopurinol and uricosuric agents are contraindicated in patients with kidney stones and other renal conditions.

✎ fenofibrate (which is used in treating hyperlipidemia) also exerts beneficial uricosuric effect.

Osteoporosis

هشاشة العظام

Definition Osteoporosis : in which the bone mineral density (BMD) is reduced, bone microarchitecture is disrupted تتعطل , and the amount and variety of non-collagenous proteins in bone is altered. Osteoporotic bones are more susceptible to fracture.

Pathogenesis ✎ osteoporosis is an imbalance between bone resorption and bone formation. Either bone resorption is excessive, and/or bone formation is diminished Bone matrix

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is manufactured by the osteoblast cells, whereas bone resorption is accomplished by osteoclast cells.

✎ Due to its hormonal component, more women, particularly after menopause, suffer from osteoporosis than men. In addition it may be caused by various hormonal conditions, smoking and medications (specifically glucocorticoids)

Signs and symptoms

Osteoporotic fractures are those that occur under slight amount of stresses ➤ Typical fractures occur in the vertebral column, hip and wrist.

Risk factors

✎ Prolonged intake of the prescription drug prednisone or any other glucocorticoid, tobacco smoking, intake of soft drinks (containing phosphoric acid e.g. Pepsi & CocaCola), low body mass index, estrogen deficiency, early menopause (<45 years) or bilateral oophorectomy, premature ovarian failure, prolonged premenstrual amenorrhea (>1 year), low calcium and vitamin D intake, alcoholism

Diagnosis

➤➤ Dual energy X-ray absorptiometry (DXA) is considered the gold standard for diagnosis of osteoporosis.

Etiology

1-Estrogen deficiency following menopause

2-testosterone deficiency.

3-Glucocorticoid or thyroxine excess states also lead to osteoporosis.

- 4- Calcium and/or vitamin D deficiency from malnutrition increases the risk of osteoporosis.
- 5- **also** smoking cigarettes, low levels of physical activity (weight bearing exercise), and family history.
- 6- **Medication:** Steroid-induced osteoporosis (SIOP) due to use of glucocorticoids, Barbiturates (due to accelerated metabolism of vitamin D).

Treatment :

- تناول وجبات تحتوي على الكالسيوم و فيتامين د
مثل اللبن و منتجاته .

R / Calcium sandoz eff. Tab.

قرص على نصف كوب ماء مرتين يوميا

Or : Oscal tab . قرص مرة واحدة يوميا

Or : One alpha 0.25 µg & 1 µg cap.

قرص واحد يوميا

R / Miacalcic amp.

أمبول تحت الجلد أو بالعضل يوميا أو يوم بعد يوم

- Anabolics :

R / Deca-durabolin amp.

أمبول بالعضل كل ١٠ - ١٥ يوم

- Androgens for males :

R / Methyl testosterone tab.

٢-١ قرص يوميا

- Estrogens for menopausal ladies :

R / Ethinyl estradiol tab.

قرص واحد يوميا

Notes :

➤➤ Patients at risk for osteoporosis (e.g. steroid use) are generally treated with vitamin D and calcium supplements.

➤➤ In osteoporosis (or a very high risk) The most often prescribed bisphosphonates are presently sodium alendronate (e.g. **Fosamax**) 10 mg a day or 70 mg once a week, risedronate (e.g. **Actonel**) 5mg a day or 35mg once a week

➤➤ Other medicines prescribed for prevention of osteoporosis include raloxifene (Evista), a selective estrogen receptor modulator (SERM).

➤➤ Increasing vitamin D intake has been shown to reduce fractures up to twenty-five percent in older people according to recent studies.

➤➤ Also bone density benefits from taking the following supplements: calcium and vitamin D, boron, magnesium, zinc, copper, manganese, silicon, folic acid, and vitamins B6, C, and K.

➤➤ Exercise is of great importance for people suffering from the osteoporosis syndrome.

➤➤ Regular load bearing حمل
exercises can help both to delay the onset of the condition, and to relieve pain; this is because regular movement can help to keep joints
مرونة الاربطة .

Prognosis

Patients with osteoporosis are at a high risk for additional fractures (the best predictor of fracture is a previous fracture). Treatment for the underlying osteoporosis can reduce the risk of a subsequent fracture considerably.

Systemic Lupus Erythematosus

- Lupus is autoimmune diseases. Lupus can affect many parts of the body, including the joints, skin, kidneys, heart, lungs, blood vessels, and brain.

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-More common in women .

- The word "systemic" means the disease can affect many parts of the body.

Causes

In lupus, the body's immune system does not work as it should. A healthy immune system produces proteins called antibodies and specific cells called lymphocytes that help fight and destroy viruses, bacteria, and other foreign substances that invade the body. In lupus, the immune system produces antibodies against the body's healthy cells and tissues. These antibodies, called autoantibodies, contribute to the inflammation of various parts of the body and can cause damage to organs and tissues. The most common type of autoantibody that develops in people with lupus is called an antinuclear antibody (ANA) because it reacts with parts of the cell's nucleus (command center). Doctors and scientists do not yet understand all of the factors that cause inflammation and tissue damage in lupus, and researchers are actively exploring them.

Symptoms of Lupus

Common Symptoms of Lupus

- Painful or swollen joints (arthritis)and muscle pain
- Unexplained fever
- Red rashes, most commonly on the face
- Chest pain upon deep breathing

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- Unusual loss of hair
- Pale or purple fingers or toes from cold or stress (Raynaud's phenomenon)
- Sensitivity to the sun
- Swelling (edema) in legs or around eyes
- Mouth ulcers
- Swollen glands
- Extreme fatigue

Symptoms can range from mild to severe and may come and go over time.

Some people also experience headaches, dizziness, depression, confusion, or seizures. New symptoms may continue to appear years after the initial diagnosis, and different symptoms can occur at different times. In some people with lupus, only one system of the body, such as the skin or joints, is affected. Other people experience symptoms in many parts of their body. Just how seriously a body system is affected varies from person to person. The following systems in the body also can be affected by lupus.

- Kidneys: e.g nephritis
 - Lungs: e.g pleuritis, pneumonia.
 - Central nervous system: e.g headaches, dizziness, memory disturbances, vision problems, seizures, stroke, or changes in behavior.
 - Blood vessels: vasculitis
 - Blood: anemia, leukopenia, or thrombocytopenia
 - Heart: myocarditis , endocarditis , pericarditis.
- Lupus can also increase the

risk of atherosclerosis
(hardening of the arteries).

Diagnosis

- Medical history
- Complete physical examination

No single test can determine whether a person has lupus, but several laboratory tests may help the doctor to make a diagnosis.

- Laboratory tests:
 - Complete blood count (CBC)
 - increased Erythrocyte sedimentation rate (ESR)
 - Urinalysis
 - Blood chemistries
 - Complement levels
 - Positive Antinuclear antibody test (ANA)
 - Other autoantibody tests (anti-DNA, anti-Sm, anti-RNP, anti-Ro [SSA], anti-La [SSB])
 - Anticardiolipin (or antiphospholipid) antibody test. The presence of this antibody may indicate increased risk for blood clotting and increased risk for miscarriage in pregnant women with lupus.
- Skin biopsy
- Kidney biopsy

It may take months or even years for doctors to piece together the symptoms to accurately diagnose this complex disease. The doctor will look at the entire picture—medical history, symptoms, and test results—to determine if a person has lupus.

Treatment

Treatment plans are tailored to the individual's needs and may change over time.

- **NSAIDs** : for joint symptoms , such as

R / Brufen tab.

قرص ٣ مرات يوميا بعد الأكل

- **Antimalarials**: These drugs were originally used to treat malaria, but doctors have found that they also are useful for lupus. A common antimalarial used to treat lupus is hydroxychloroquine (Plaquenil)*. It may be used alone or in combination with other drugs and generally is used to treat fatigue, joint pain, skin rashes, and inflammation of the lungs. Side effects of antimalarials can include stomach upset and, extremely rarely, damage to the retina of the eye.

R / Plaquenil 200mg. tab.

قرص واحد إلى قرصين يوميا

- **Corticosteroids**: to suppress inflammation. such as

R / Deltasone (prednisone) tab.

Or : Hostacortin tab.

٢-١ مجم / كجم من وزن الجسم حتى تتحسن الحالة
ثم تخفض الجرعة تدريجيا

Or : R/ Epidrone (dexamethasone) amp.

Or : Depo-medrol

(methylprednisolone) amp.

It is dangerous to stop taking corticosteroids suddenly

Chapetr - 10

- **Immunosuppressives:** For some patients whose kidneys or central nervous systems are affected by lupus, a type of drug called an immunosuppressive may be used. Immunosuppressives, such as cyclophosphamide (Cytoxan) and mycophenolate mofetil (CellCept), restrain the overactive immune system by blocking the production of immune cells. Side effects may include nausea, vomiting, hair loss, bladder problems, decreased fertility, and increased risk of cancer and infection.

R / Immuran 50 mg tab.

or : Cell cept tab.

قرص ٢-٣ مرات يوميا

Ankylosing Spondylitis

What Is Ankylosing Spondylitis?

Ankylosing spondylitis (AS) is a rheumatic disease that causes arthritis of the spine and sacroiliac joints and can cause inflammation of the eyes, lungs, and heart valves. It varies from intermittent episodes of back pain that occur throughout life to a severe chronic disease that attacks the spine, peripheral joints and other body organs, resulting in severe joint and back stiffness, loss of motion and deformity as life progresses.

Rheumatology

AS is a member of the family of diseases that attack the spine called spondylarthropathies.

Causes

The cause of AS is not known, but all of the spondylarthropathies share a common genetic marker, called HLA-B27, in most affected individuals. In some cases, the disease occurs in these predisposed people after exposure to bowel or urinary tract infections.

Diagnosis

- Laboratory evaluation may reveal an elevated sedimentation rate (an indicator of inflammation), anemia .
- A positive HLA-B27 assay.
- X-rays and bone scans may show characteristic changes.

Treatment

- **Physiotherapy .**

- **Medical drugs :**

R / Indocid cap.

١-٢ كبسولة بعد الأكل ٣ مرات يوميا

Or : Indomethacin 100 mg Supp.

لبوس شرجي قبل النوم يوميا

Or : feldene 20 mg cap.

كبسولة مرة واحدة يوميا

Chapter - 11 Surgery

Appendicitis

Appendicitis : is a condition characterized by inflammation of the appendix.

While mild cases may resolve without treatment, most require removal of the inflamed appendix, either by laparotomy or laparoscopy. Untreated, mortality is high, mainly due to peritonitis إالتهاب البريتوني and shock.



Causes

Location of the appendix in the digestive system
The appendix loses the ability to fight infection and fecal bacteria begin to grow out of control. with the lack of treatment the walls of the appendix eventually become gangrenous from the infection and lack of blood flow. As bacteria begin to leak out through the dying walls, pus forms within and around the appendix (suppuration متقيح). The end result of this is appendiceal rupture causing peritonitis, which may lead to septicemia إنتسمم الدم and eventually death.

Signs, symptoms and findings

Appendicitis can be classified into two types, typical and atypical. The pain of typical acute appendicitis usually starts centrally (periumbilical) before localising to the right iliac

fossa (the lower right side of the abdomen). There is usually associated loss of appetite (anorexia) and fever. Nausea, or vomiting may or may not occur. ⚡ Diagnosis is easier in typical acute appendicitis and surgery removes a swollen appendix with little or no suppuration (pus) if operated early (within 24 hours of onset).

Diagnosis

1- based on history and physical examination ⚡ an elevation of neutrophilic white cells, & infection markers on blood testing and imaging.
2- The classical history in appendicitis is diffuse pain in the periumbilical region ⚡ This point is located on the right-hand side of the abdomen one-third of the distance between the anterior superior iliac spine and the navel. Here, on gentle palpation, the abdominal muscles often feel firm to rigid because of involuntary spasm, and a cough also produces a localized soreness.
3- right-side tenderness on a digital rectal exam. Since the appendix normally lies on the right, if a finger is inserted into the rectum and there is tenderness when pressure is applied toward the right, this indicates an increased likelihood احتمالية that the patient has appendicitis.

4- Ultrasonography and Doppler sonography also provide useful

means to detect appendicitis, especially in children.
5- CT scan has become the diagnostic test of choice, especially in adults.

Treatment

appendicitis can be treated by removal of the appendix through a surgical procedure called an appendectomy

☞ Antibiotics are often given intravenously to help kill remaining bacteria and thus reduce the incidence of infectious complication in the abdomen or wound.

Prognosis

appendicitis patients recover easily with treatment, but complications can occur if treatment is delayed or if peritonitis occurs.

☞ The real possibility of life-threatening peritonitis is the reason why acute appendicitis warrants speedy evaluation and treatment.

☞ Appendectomies have occasionally been performed in emergency conditions (i.e. outside of a proper hospital), when a timely medical evacuation was impossible.

Hemorrhoids (Piles)

Definition Hemorrhoids are painful, swollen veins in the lower portion of the rectum or anus.

Causes, incidence, and risk factors

This condition is very common, especially during pregnancy and after childbirth. Hemorrhoids result from increased pressure in the veins of the anus. The pressure causes the veins to bulge **تبرز** and expand, making them painful, particularly when sitting.

The most common cause is straining during bowel movements.

Hemorrhoids may result from constipation, sitting for long periods of time, and anal infections. In some cases they may be caused by other diseases, such as liver cirrhosis.

Internal hemorrhoids occur just inside the anus, at the beginning of the rectum. External hemorrhoids occur at the anal opening and may hang outside the anus.

Symptoms

Symptoms of hemorrhoids include:

- Anal itching
- Anal ache or pain, especially while sitting
- Bright red blood on toilet tissue, stool, or in the toilet bowl
- Pain during bowel movements
- One or more hard tender lumps near the anus

Signs and tests

A doctor can often diagnose hemorrhoids simply by examining the rectal area. If necessary, tests that may help diagnose the problem include:

- Stool guaiac (shows the presence of blood)
- Sigmoidoscopy
- Anoscopy

Treatment

- **Sitz baths** can help the patient to feel better. Sit in warm water for 10 to 15 minutes.

- **Diet rich fiber**

- Over-the-counter **corticosteroid creams** can reduce pain and swelling. Hemorrhoid creams with lidocaine can reduce pain.

R / Proctosedyl cream .

Or : Proctoglyvenol cream .

Or : Anusol Hc cream or supp.

Or : Lignocaine gel.

دهان لفتحة الشرج من الداخل مرتين يوميا

- **Stool softeners** help reduce straining الحزق and constipation.

R / Minalax tab.

Or : Nasar tab.

قرص عند اللزوم

+ R / Daflon 500 tab.

قرص كل ١٢ ساعة

R / Dioven tab.

Or : Diosed C Cap.

٢ قرص أو كبسولة كل ١٢ ساعة

- **Analgesic :**

R / Bi-profenid tab.

قرص كل ١٢ ساعة

Surgery : - For cases that don't respond to home treatments, a doctor may recommend surgery, like rubber band ligation or surgical

hemorrhoidectomy. These procedures are generally used for patients with severe pain or bleeding who have not responded to other therapy.

Expectations (prognosis)

Most Treatments are effective, but to prevent the hemorrhoids from coming back, a high-fiber diet and drinking plenty of fluids may be needed .

Complications

The blood in the enlarged veins may form clots, and the tissue surrounding the hemorrhoids can die. Hemorrhoids with clots generally require surgical removal.

Severe bleeding may also occur.

Iron deficiency anemia can result from prolonged loss of blood.

Significant bleeding from hemorrhoids is unusual, however.

Prevention

- Avoid straining during bowel movements.

- Avoid constipation. Drink plenty of fluids, at least eight glasses per day.

- Eat a high-fiber diet of fruits, vegetables, whole grains. Consider fiber supplements.

Hemorrhoid surgery (Hemorrhoidectomy)

Definition Hemorrhoid surgery is the removal of enlarged veins around the anus (hemorrhoids).

Description

Hemorrhoids are swollen (enlarged, dilated) veins (varicose veins) inside (internal) or outside (external) the anus that are usually caused by increased pressure, such as straining when constipated or during pregnancy. Hemorrhoids can cause pain, bleeding, clots, and itching.

Hemorrhoids can be removed surgically while the patient is sedated and pain-free (local or spinal anesthesia) or deep asleep and pain-free (general anesthesia). The enlarged vein (hemorrhoid) is removed and a gauze packing is inserted to reduce bleeding.

Smaller hemorrhoids can be banded -- a small rubber band is placed around the base of the hemorrhoid, causing the hemorrhoid tissue to die and fall off from lack of blood flow. Alternatively, such hemorrhoids can be injected with a sclerosing (hardening) agent, which has the same effect. These procedures can often be done as an outpatient or office procedure with minimal or no anesthesia.

Indications

Hemorrhoid removal may be recommended when nonsurgical treatment (fiber-rich diet, laxatives, stool softener, suppositories, medications, warm baths) has not provided adequate relief from:

- Persistent itching
- Anal bleeding
- Pain

- Blood clots (thrombosis of the hemorrhoids)
- Infection

Anal fissure**Definition**

An anal fissure is a small split or tear in the anal mucosa that may cause painful bowel movements and bleeding. There may be blood on the outside of the stool or on the toilet tissue following a bowel movement.

Causes, incidence, and risk factors

Anal fissures are extremely common in young infants but may occur at any age. Studies suggest 80% of infants will have had an anal fissure by the end of the first year. Most fissures heal on their own and do not require treatment, aside from good diaper hygiene. However, some fissures may require medical treatment.

The incidence of anal fissures decreases rapidly with age. Fissures are much less common among school-aged children than among infants.

In adults, fissures may be caused by constipation, the passing of large, hard stools, or by prolonged diarrhea. In older adults, anal fissures may be caused by decreased blood flow to the area.

Anal fissures are also common in women after childbirth and people with Crohn's disease.

Symptoms

- Pain while having a bowel movement
- Blood on the surface of stool (not mixed in with stool)
- Blood on toilet tissue or wipes
- A crack in the skin that is visible when the anus is stretched slightly (the fissure is almost always in the midline)
- Constipation, often with painful bowel movements

Signs and tests

- Inspection of the rectum
- Physical exam of the rectal mucosa

Treatment

- Stool softeners
R / Glycerin supp.
ليوسنة عند اللزوم
- Dietary adjustment (addition of bulk -- substances that absorb water while in the intestinal tract)
- Cleansing more gently
- Petroleum jelly
- Sitz bath
- Anesthetic ointment, if pain interferes with normal bowel movement
R / H-formula oint.
Or : Lignocaine oint .

Or : Neo-haemorrhoid oint.
or : Procto-4 oint .

دهان لفتحة الشرج مرتين يوميا

- Topical muscle relaxants
R / Moove massage cream .

دهان مرتين يوميا

These measures generally heal more than 90% of anal fissures.

For fissures that do not heal with these home treatments, injection of botulinum toxin (Botox) into the anal sphincter may be used to temporarily paralyze the anal sphincter muscle and promote healing. Another option for nonhealing fissures is a minor surgical procedure to relax the sphincter.

Expectations (prognosis)

Anal fissures generally heal quickly without residual problems. However, people who develop fissures are more likely to have them in the future.

Complications

Occasionally, a fissure becomes chronic and will not heal. Chronic fissures may require minor surgery to relax the sphincter.

Prevention

To prevent anal fissures in infants, be sure to change diapers frequently.

To prevent fissures at any age:

- Keep the anal area dry

- Wipe with soft materials or a moistened cloth or cotton pad
- Promptly treat any constipation or diarrhea
- Avoid irritating the rectum

Varicose veins

Alternative names

Varicosity; Varicosis

Definition Varicose veins are enlarged, twisted, painful superficial veins resulting from poorly functioning valves.

Causes, incidence, and risk factors

In normal veins, valves in the vein keep blood moving forward toward the heart. With varicose veins, the valves do not function properly, allowing blood to remain in the vein. Pooling تجمع of blood in a vein causes it to enlarge.

This process usually occurs in the **veins of the legs**, although it may occur elsewhere. Varicose veins are common, affecting mostly **women**.

Causes include congenitally defective valves, thrombophlebitis, and pregnancy. **Prolonged standing** and increased pressure within the abdomen may increase susceptibility to the development of varicose veins or aggravate the condition.

Primary varicose veins occur because of congenitally defective valves, or without a known cause. Secondary varicose veins occur because of another condition, such as occurs when a pregnant woman develops varicose veins.

Symptoms

- Pain in the legs: fullness, heaviness, aching
- Visible, enlarged veins
- Mild swelling of ankles
- Skin at the ankle discolored brown
- Skin ulcers near the ankle

Signs and tests

The Diagnosis is based primarily on the characteristic appearance of the legs when the patient is standing or is seated with the legs dangling. At times a physician may order a duplex ultrasound exam of extremity to see blood flow and characterize the vessels, and to rule out other disorders of the legs. Rarely, an angiography of the legs may be performed to rule out other disorders.

Treatment

- Avoid excess standing, elevate the legs when resting or sleeping, and to wear elastic support hose.

R / Hirudoid oint.

Or : Thrombophob gel .

Or : Reparil gel.

دهان موضعی مرتین یومیا

R / Rutin C tab.

Or : Daflon 500 tab.

قرص كل ١٢ ساعة

Surgery such as vein stripping and ligation (removal of the varicose vein), or sclerotherapy of veins (injecting with a solution that causes scarring, which closes the vein) may be recommended. Vein stripping is a very extensive procedure, and it is usually reserved for patients who are experiencing a lot of pain or who have skin ulcers.

Expectations (prognosis)

Varicose veins tend to worsen over time. Discomfort and progression may be lessened with self care.

Complications

- Phlebitis (chronic inflammation of the vein)
- Formation of leg ulcers
- Rupture of a varicose vein

Prevention Avoid prolonged standing if personal or family history indicates patient is at risk of developing varicose veins.

Fistula

Definition

A fistula is an abnormal connection between an organ, vessel, or intestine and another structure. Fistulas are usually the result of injury or surgery. It can also result from infection or inflammation.

Inflammatory bowel disease, such as ulcerative colitis or Crohn's disease, is an example of a disease that leads to fistulas between one loop of intestine and another. Injury can lead to fistulas between arteries and veins.

Information

Fistulas may occur in many parts of the body. Some of these are:

- Arteriovenous (between an artery and vein)
- Biliary (created during gallbladder surgery, connecting bile ducts to the surface of the skin)
- Cervical (either an abnormal opening into the cervix or in the neck)
- Craniosinus (between the space inside the skull and a nasal sinus)
- Enterovaginal (between the bowel and vagina)
- Fecal or anal (the feces is discharged through an opening other than the anus)
- Gastric (from the stomach to the surface of the skin)
- Metroperitoneal (between the uterus and peritoneal cavity)
- Pulmonary arteriovenous (in a lung, the pulmonary artery and vein are connected, allowing the blood to bypass the oxygenation process in the lung (pulmonary arteriovenous fistula)
- Umbilical (connection between the navel and gut)

Types of fistulas include:

- Blind (open on one end only, but connects to two structures)
- Complete (has both external and internal openings)
- Horseshoe (connecting the anus to the surface of the skin after going around the rectum)
- Incomplete (a tube from the skin that is closed on the inside and does not connect to any internal structure)

Treatment : by surgery

Burns

Definition

There are three levels of burns:

- **First-degree** burns affect only the outer layer of the skin. They cause pain, redness, and swelling.
- **Second-degree** (partial thickness) burns affect both the outer and underlying layer of skin. They cause pain, redness, swelling, and blistering.
- **Third-degree** (full thickness) burns extend into deeper tissues. They cause white or blackened, charred skin that may be numb.

Causes

Burns can be caused by dry heat (like fire), wet heat (such as steam or

hot liquids), radiation, friction, heated objects, the sun, electricity, or chemicals.

Symptoms

- Blisters
- Pain (the degree of pain is not related to the severity of the burn -- the most serious burns can be painless)
- Peeling skin
- Red skin
- Shock (watch for pale and clammy skin, weakness, bluish lips and fingernails, and a drop in alertness)
- Swelling
- White or charred skin

Symptoms of an airway burn:

- Charred mouth; burned lips
- Burns on the head, face, or neck
- Wheezing
- Change in voice
- Difficulty breathing; coughing
- Singed nose hairs or eyebrows
- Dark, carbon-stained mucus

First Aid

FOR MINOR BURNS

1. If the skin is unbroken, run cool water over the area of the burn or soak it in a cool water bath (not ice water). Keep the area submerged for at least 5 minutes. A clean,

- cold, wet towel will also help reduce pain.
2. Calm and reassure the person.
 3. After flushing or soaking, cover the burn with a dry, sterile bandage or clean dressing.
 4. Protect the burn from pressure and friction.
 5. Over-the-counter ibuprofen or acetaminophen can help relieve pain and swelling. DO NOT give children under 12 aspirin. Once the skin has cooled, moisturizing lotion also can help.
- R / Brufen tab. Or Syrup.**
 قرص أو ملعقة ٣ مرات يوميا
- Or : Voltaren gel . (in the first degree only)**
 دهان ٣ مرات يوميا
6. Minor burns will usually heal without further treatment. However, if a second-degree burn covers an area more than 2 to 3 inches in diameter, or if it is located on the hands, feet, face, groin, buttocks, or a major joint, treat the burn as a major burn.
 7. Make sure the person is up-to-date on tetanus immunization.
 2. Make sure that the person is no longer in contact with smoldering materials. However, DO NOT remove burnt clothing that is stuck to the skin.
 3. Make sure the person is breathing. If breathing has stopped, or if the person's airway is blocked, open the airway. If necessary, begin rescue breathing and CPR.
 4. Cover the burn area with a dry sterile bandage (if available) or clean cloth. A sheet will do if the burned area is large. DO NOT apply any ointments. Avoid breaking burn blisters.
 5. If fingers or toes have been burned, separate them with dry, sterile, non-adhesive dressings.
 6. Elevate the body part that is burned above the level of the heart. Protect the burnt area from pressure and friction.
 7. Take steps to prevent shock. Lay the person flat, elevate the feet about 12 inches, and cover him or her with a coat or blanket. However, DO NOT place the person in this shock position if a head, neck, back, or leg injury is suspected or if it makes the person uncomfortable.
 8. Continue to monitor the person's vital signs. This means pulse, rate of breathing, and blood pressure.

FOR MAJOR BURNS

1. If someone is on fire, tell the person to STOP, DROP, and ROLL. Wrap the person in thick material to smother the flames (a wool or cotton coat, rug, or blanket). Douse the person with water.

Treatment : in severe cases : (Third degree)

- Prevention of shock .
By oral fluids of I.V. fluids & epinphrine in severe cases.
- Prevention of infection :
Removing the dead skin then clean with normal saline
R / Furaseen oint.
Or / Bivacyn spray .
دهان او رش للحرق بعد تطهيره بمحلول ملح
R / Sofra-tulle dressing .
يوضع شاش غيار مرة واحدة يوميا بعد الدهان
R / Flumox cap.
كبسولة كل ٨ ساعات
- Skin grafting is needed for full thickness burns as soon as possible to limit infection .
- Antitetanic serum & anti-gas gangrene serum is needed.

برنامج Atlas-10 الصيدليات

برنامج صيدليات قوى ورائع -
يمكنك من معرفة استعمال كل
دواء باللغة العربية اثناء البيع

يحتوى على جميع الادوية
الموجودة بالصيدلية

مبرمج مسبقاً ليعمل
بالباركود الموجود على علبة
الدواء

امكانية تعديل الدواء
والباركود

مرفق معه كتيب عن كيفية
التشغيل .

بضغطة على لوحة المفاتيح

يمكنك معرفة مبيعات اليوم -

والشهر - واجمالى محتويات الصيدلية
بسعر الشراء وسعر البيع - مع كلمة
سر لكل شاشة .

يمكنك تقسيم مبيعات
اليوم الى فترات - ومعرفة
مبيعات كل فترة . للتحكم فى
العاملين على البرنامج .

متابعة تواريخ الانتهاء -
وعمل الطلبات من خلال
البرنامج

متابعة المبيعات اليومية -
الشهرية ومبيعات فترة من
اليوم بضغطة واحدة

سهل وبسيط ولا يحتاج الى
دعم فنى .

امكانية معرفة اجمالى
محتويات الصيدلية بسعر الشراء
وسعر البيع فى اى وقت -
بضغطة واحدة - بكلمة سر .

مرفقة به كتيب وكذلك شرح فيديو
عن كيفية استعمال البرنامج بالتفصيل .

تقدمه الشركة الدولية للتكنولوجيا
والبرمجة بسعر زهيد

ثمانون جنيهاً بدلاً من ألف جنيهاً
للاستعلام ٠١٢٣٩٥٩٠٣١

Chapetr -12

Blood Diseases

(Haematology)

Hemophilia

Definition

Hemophilia is a hereditary bleeding disorder in which it takes a long time for the blood to clot and abnormal bleeding occurs. This disease affects mostly males. Diseases in this category include:

- hemophilia A
- hemophilia B
- von Willebrand's disease

Hemophilia A

Definition Hemophilia A is a hereditary bleeding disorder caused by a lack of the blood clotting factor VIII.

Causes, incidence, and risk factors

Hemophilia A results from a deficiency (lack) of clotting factor VIII.

The disorder is caused by an inherited X-linked recessive trait, with the defective gene located on the X chromosome. That means the disorder occurs primarily in males. Females carry two copies of the X chromosome, so if the factor VIII

gene on one chromosome doesn't work, the gene on the other chromosome can do the job. Males, however, carry only one X chromosome, so if the factor VIII gene on that chromosome is broken, they will have hemophilia A.

If a woman has a defective factor VIII gene, she is considered a carrier. The gene can be passed down to her children. Half of the male babies born from women who carry the defective gene have the disease. Half of the female babies born from women who have the defective gene are carriers. All female children of men with hemophilia carry the defective gene.

The severity of symptoms can vary. Severe forms become apparent early on. Bleeding is the main symptom of the disease and sometimes, though not always, occurs if an infant is circumcised. Additional bleeding problems are seen when the infant starts crawling and walking.

Mild cases may go unnoticed until later in life when they occur in response to surgery or trauma. Internal bleeding may happen anywhere, and bleeding into joints is common. Risk factors are a family history of bleeding and being male.

Symptoms

- Bruising
- Spontaneous bleeding
- Bleeding into joints and associated pain and swelling
- Gastrointestinal tract and urinary tract hemorrhage
- Blood in the urine or stool
- Prolonged bleeding from cuts, tooth extraction, and surgery

stored within the lining of blood vessels.

R / Minirin nasal Spray .

بخة للأنف حتى يتوقف النزيف

- To prevent a bleeding crisis, people with hemophilia and their families can be taught to give factor VIII concentrates at home at the first signs of bleeding. People with severe forms of the disease may need regular preventative treatment.

Signs and tests

Many blood clotting tests are performed if the person tested is the first one in the family to have a bleeding disorder. Once the defect has been identified, other family members will need less testing to diagnose the disorder.

- Depending on the severity of the disease, DDAVP or factor VIII concentrate may be given prior to dental extractions and surgery to prevent bleeding.

Tests include:

- Prolonged PTT
- Normal prothrombin time
- Normal bleeding time
- Normal fibrinogen level
- Low serum factor VIII activity

Immunization with Hepatitis B vaccine is necessary because of the increased risk of exposure to hepatitis due to frequent infusions of blood products.

Patients who develop an inhibitor to factor VIII may require treatment with other clotting factors such as factor VIIa, which can aid clotting even in the absence of factor VIII.

Treatment

- Standard treatment involves replacing the missing clotting factor. The amount of factor VIII concentrates needed depend upon the severity of bleeding, the site of the bleeding, and the size of the patient.

- Mild hemophilia may be treated with desmopressin (DDAVP), which helps the body release factor VIII that is

Hemophilia B

Definition Hemophilia B is a hereditary blood coagulation disorder. It is caused by a deficiency of a blood plasma protein called factor IX that affects the clotting property of blood.

Causes, incidence, and risk factors

Hemophilia A is 7 times more common than hemophilia B.

Hemophilia B is the result of a deficiency of clotting factor IX.

The disorder is caused by an inherited X-linked recessive trait, with the defective gene located on the X chromosome. Thus, the disorder occurs primarily in males. Females carry two copies of the X chromosome, so if the factor IX gene on one chromosome is defective, the other can compensate. Males, however, carry only one X chromosome, so if the factor IX gene on that chromosome is defective, they have the disease.

Females with one defective factor IX gene are carriers of this trait. Fifty percent of the male offspring of female carriers will have the disease, and 50% of their female offspring will be carriers. All female children of a male hemophiliac will be carriers of the trait.

The severity of symptoms can vary with this disease, and the severe forms become apparent early on. Bleeding is the hallmark of the disease and sometimes, though not always, occurs if an infant is circumcised. Additional bleeding manifestations make their appearance when the infant becomes mobile.

Mild cases may go unnoticed until later in life, when they occur in response to surgery or trauma. Internal bleeding may occur anywhere and bleeding into joints is common. Risk factors are a family history of bleeding and being male.

Hemophilia B occurs in about 1 out of 32,000 men.

Symptoms

- Nosebleeds
- Bruising
- Spontaneous bleeding
- Bleeding into joints and associated pain and swelling
- Gastrointestinal tract and urinary tract hemorrhage
- Blood in the urine or stool
- Prolonged bleeding from cuts, tooth extraction, and surgery
- Excessive bleeding following circumcision

Signs and tests

Coagulation studies involving many tests are performed if the person tested is the first one in the family to have a bleeding disorder. Once the defect has been identified, other family members will need less testing to diagnose the disorder.

- PTT is prolonged.
- Prothrombin time is normal.
- Bleeding time is normal.
- Fibrinogen level is normal.
- Serum factor IX is reduced.

Treatment

Standard treatment is infusion of factor IX concentrates to replace the defective clotting factor. The amount infused depends upon the severity of bleeding, the site of the bleeding, and the size of the patient. Hepatitis B vaccine is recommended for individuals with Hemophilia B because they are at increased risk of developing hepatitis due to exposure to blood products.

Depending on the severity of the disease, factor IX concentrate may be given prior to dental extractions and surgery to prevent bleeding.

Von Willebrand disease

Definition Von Willebrand disease is the most common hereditary bleeding disorder.

Causes, incidence, and risk factors

Von Willebrand disease is caused by a deficiency of von Willebrand factor. Von Willebrand factor helps platelets to clump together and stick to the blood vessel wall, which is necessary for normal blood clotting.

Von Willebrand disease affects both men and women. Most cases are mild. Bleeding may occur after surgery or when patient has a tooth pulled. Aspirin and other nonsteroidal anti-inflammatory drugs (NSAIDs) can make this condition worse. Bleeding may decrease during pregnancy.

A family history of a bleeding disorder is the primary risk factor. In women with heavy or prolonged menstrual bleeding, von Willebrand is more common in Caucasian women than African American women.

Symptoms

- Nose bleeds
- Bleeding of the gums
- Abnormal menstrual bleeding
- Bruising
- Skin rash

Signs and tests

- Normal platelet count
- Prolonged bleeding time
- Reduced von Willebrand factor level
- Reduced platelet aggregation (platelet aggregation test)
- Ristocetin co-factor is reduced

This disease may also alter the results of the following tests:

- Factor VIII level
- Von Willebrand factor multimers

Treatment

Medications such as desamino-8-arginine vasopressin (DDAVP) can be given to raise the levels of von Willebrand factor, which will reduce the tendency toward bleeding.

Blood plasma or certain factor VIII preparations may also be used to decrease bleeding.

Some types of von Willebrand disease do not respond to DDAVP. Tests should be done to determine a patient's specific type of von Willebrand disease, before trauma or surgery occurs. A trial of DDAVP can be done prior to surgery to test whether von Willebrand factor levels increase.

Agranulocytosis**Definition**

Agranulocytosis is a condition in which there is an insufficient number of white blood cells called neutrophils or granulocytes. This can be caused by a failure of the bone marrow to make sufficient neutrophils, or when white blood cells are destroyed faster than they can be produced. Affected people are susceptible to infections.

**Megaloblastic anaemia
(Pernicious anemia)**

Pernicious anemia refers to a type of autoimmune anemia. Antibodies are directed against intrinsic factor or parietal cells which produce intrinsic factor. Intrinsic factor is required for vitamin B12 absorption, so impaired absorption of vitamin B12 can result. An anemia is a deficiency of the blood cells, but in addition to blood cells, many other cells in the body need vitamin B12, including nerve cells.

The term pernicious anemia is sometimes used more loosely to include non-autoimmune causes of vitamin B12 deficiency.

Diagnosis :

Blood testing typically shows a macrocytic, normochromic anemia, and low levels of serum vitamin B12. A Schilling test can then be used to distinguish between pernicious

anemia, vitamin B12 malabsorption, and vitamin B12 deficiency. Approximately 90% of individuals with pernicious anemia have antibodies for parietal cells, however only 50% of individuals with these antibodies have the disease.

Pernicious anaemia is more common among women (1.6 : 1) with a peak occurrence at the age of sixty. It has a hereditary component, and it is notably more common in persons of Northern European ancestry.

Symptoms :

Symptoms may include weakness, an abnormally rapid heartbeat (tachycardia), shortness of breath, chest pains, an upset stomach including diarrhea, difficulty walking, numbness and tingling in the extremities, lack of color (pallor) in the lips, gum, and tongue, and/or depression. Pernicious anemia may cause inflammation of the tongue (glossitis). It is also associated with premature greying, blue eyes, vitiligo, and blood group A.

It is also associated with unpredictable periods of fatigue and an inability to concentrate. Irreversible Central Nervous System (CNS) damage may have occurred prior to Treatment. Scissors gait can appear as a late sign of unchecked anemia.

Some sufferers also report mouth ulcers, joint pain and tinnitus as associated with the onset of pernicious anemia.

Treatment :

R / Betolvex amp.

Or : Depovit-B12 Amp .

أمبول بالعضل أسبوعيا

R / Folic acid 5 mg tab.

قرص واحد يوميا

Notes : Treatment is with vitamin B₁₂ (hydroxycobalamin or cyanocobalamin) injected intramuscularly. Body stores (in the liver) are refilled with half a dozen injections in the first couple of weeks and then maintenance with monthly to quarterly injections throughout the life of the patient.

B12 has traditionally been given parenterally to ensure absorption. However, oral replacement is now an accepted route, as it has become increasingly appreciated that

Iron deficiency anemia

Having iron deficiency anemia may cause to feel tired and often look pale. It's a common type of anemia — a condition in which blood is lacking healthy red blood cells, which carry oxygen to tissues. Oxygenated blood gives the body energy and skin a healthy color.

As the name implies, iron deficiency anemia is due to insufficient iron. the body needs the element iron to make hemoglobin, a substance in red blood

cells that enables them to carry oxygen.

Iron deficiency anemia is common, especially in women. One in five women and half of all pregnant women are iron deficient. Lack of iron in diet is one cause of iron deficiency anemia, but there are other causes as well.

Correction of iron deficiency anemia by iron supplementation. Sometimes, other Treatments are necessary if patient is bleeding internally.

Signs and symptoms

In general, anemia causes extreme fatigue, pale skin, weakness, shortness of breath, lightheadedness, and often cold hands and feet.

Signs and symptoms of iron deficiency anemia in particular may include:

- Inflammation or soreness of tongue
- Brittle nails
- Unusual cravings for non-nutritive substances, such as ice, dirt or pure starch
- Headache
- Poor appetite, especially in infants and children with iron deficiency anemia

Some people with iron deficiency anemia experience restless legs syndrome — an uncomfortable tingling or crawling feeling in legs that's generally relieved by moving them.

Causes

Blood consists of liquid called plasma and three types of blood cells:

- **White blood cells.** These blood cells fight infection.
- **Platelets.** These blood cells help blood clot after a cut.
- **Red blood cells (erythrocytes).** These blood cells carry oxygen from lungs, by way of bloodstream, to brain and the other organs and tissues. The body needs a supply of oxygenated blood to function. Oxygenated blood helps give the body its energy and skin a healthy glow.

Red blood cells contain hemoglobin, an iron-rich substance that gives blood its red color. Hemoglobin enables red blood cells to carry oxygen from lungs to all parts of the body.

Red blood cells are manufactured in bone marrow — a red, spongy material located within the cavities of many of large bones, such as pelvic bones. Bone marrow needs iron, along with vitamins, to produce hemoglobin and red blood cells. The body gets vitamins and iron from the foods . The body also recycles iron from old red blood cells.

Patient can be mildly deficient in iron and not develop anemia. Iron deficiency leads to anemia when the body lacks sufficient iron to make adequate hemoglobin. Without

enough hemoglobin, red blood cells are smaller and paler than normal, and they can't carry adequate oxygen to tissues.

Causes of iron deficiency anemia include:

- **Blood loss.** Blood contains iron within red blood cells. If Patient loses blood, he loses some iron. Women with heavy periods are at risk of iron deficiency anemia because they lose a lot of blood during menstruation. Slow, chronic blood loss from a source within the body — such as a peptic ulcer, a hiatal hernia, a kidney or bladder tumor, a colon polyp, colorectal cancer, or uterine fibroids — can cause iron deficiency anemia. Gastrointestinal bleeding from regular use of aspirin or nonsteroidal anti-inflammatory drugs (NSAIDs) or bleeding from hemorrhoids also can be a source of iron loss and anemia. While not common in the United States, hookworm infestation can cause blood loss. Blood lost from within the body may show up in urine or stools, producing black or bloody stools.
- **A lack of iron in diet.** the body regularly gets iron from the foods eaten. If too little iron is consumed, over time the body can become iron deficient. Examples of iron-rich foods include meat, eggs and whole-grain or iron-fortified foods.

Infants and children need iron from their diet, too.

An inability to absorb iron. Iron from food is absorbed into bloodstream in small intestine. An intestinal disorder such as Crohn's disease or celiac disease, which affects intestine's ability to absorb nutrients from digested food, can lead to iron deficiency anemia. If part of small intestine has been bypassed or removed surgically, that may affect ability to absorb iron and other nutrients. Some medications can interfere with iron absorption. For example, regular use of prescription-strength stomach acid blockers called proton pump inhibitors may lead to iron deficiency anemia, although this is rare. The body needs stomach acid, which these products suppress, to convert dietary iron into a form that can readily be absorbed by the small intestine.

- Pregnancy. Without iron supplementation, iron deficiency anemia occurs in many pregnant women because their iron stores need to serve their own increased blood volume as well as be a source of hemoglobin for the growing fetus. A fetus needs iron to develop red blood cells, blood vessels and muscle.

Risk factors

These factors may increase the risk of iron deficiency anemia:

- Heavy menstrual periods
- Pregnancy

- A diet consistently low in iron
- A known or hidden source of bleeding within the body, such as an ulcer, a bleeding tumor, a uterine fibroid, a colon polyp, colorectal cancer, gastrointestinal bleeding or hemorrhoids

These groups of people may be at higher risk:

- Women. Because their bodies store less iron and because they lose blood during menstruation, women in general are at greater risk of iron deficiency anemia.
- Infants and children. Infants who don't get enough iron in their milk or formula may risk deficiency. Children need extra iron during growth spurts, because iron is also important for muscle development. If child isn't eating a healthy, varied diet, he or she may be at risk of anemia.
- Vegetarians. Because vegetarians don't eat meat, they're at greater risk of iron deficiency anemia. Iron that comes from grains and vegetables isn't absorbed by the body as well as is iron that comes from meat.

In healthy men and postmenopausal women, iron deficiency usually points to bleeding somewhere in the gastrointestinal tract.

Donating blood — a source of blood loss — usually isn't a risk factor for iron deficiency anemia. However, some people first learn their hemoglobin is low, which indicates anemia, when they go to donate blood. Low hemoglobin may be a temporary problem remedied by eating more iron-rich foods. It may also be a warning sign of blood loss in the body.

Screening and Diagnosis

- Hb % & blood picture : show hypochromic microcytic anemia , normal platelets & white cell count .

With iron deficiency anemia, red blood cells are smaller and paler in color than normal.

Normal levels of hemoglobin range between 11.1 and 15.0 grams per deciliter (g/dL). hemoglobin is low if:

- For women, it's less than 10 g/dL
- For men, it's less than 12 g/dL

Additional diagnostic tests

Required in case of a source of bleeding is suspected within the body .

Blood in the stools is often an indicator of internal bleeding.

- Endoscopy. check for bleeding from a hiatal hernia, bleeding ulcers and stomach bleeding with the aid of endoscopy.

- Colonoscopy. to view some or all of colon and rectum to look for internal sources of bleeding.

Complications

Mild iron deficiency anemia usually doesn't cause complications. However, left untreated, iron deficiency anemia can become severe and lead to health problems, including the following:

- Heart problems. Iron deficiency anemia may lead to a rapid or irregular heartbeat. Heart must pump more blood to compensate for the lack of oxygen in the blood when patient is anemic. In people with coronary artery disease — narrowing of the arteries that feed the heart — unchecked anemia can lead to angina. Angina is chest pain caused by decreased oxygen and blood flow to the heart muscle.
- Problems during pregnancy. In pregnant women, severe iron deficiency anemia has been linked to premature births and low birth weight babies. But the condition is easily preventable and treatable in pregnant women who receive iron supplements as part of their prenatal care.
- Growth problems. In infants and children, severe iron deficiency can lead to anemia as well as delayed growth. Untreated iron deficiency anemia can cause physical and mental delays in infants and

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children in areas such as walking and talking.

Treatment

- eating foods rich in iron include red meat, seafood, poultry and eggs , whole-grain, iron-fortified cereals, breads and pastas. Beans and peas, dark green leafy vegetables — such as spinach — and raisins, nuts, and seeds also contain iron..

Adult :

R / Ferose tab.

Or : Fefol Cap.

Or : Haemoton cap.

قرص أو كبسولة مرة واحدة يوميا بعد الاكل

Injectable iron can be used :

R / Ferosac amp.

Or : cosmofer amp.

أمبول بالعضل يوميا أو يوم بعد يوم

Pediatric :

R / fer-in-sol oral drops .

١٠ - ١٥ نقطة بالفم ٣ مرات يوميا

Children :

R / ferose Syrup.

Or : Ferroglobin Syrup.

ملعقة ١-٢ مرة يوميا

N.B : Treatment should be continued for several months or longer until Hb level return to normal .

N.B. iron can irritate stomach, so it should be taken with food. Coated versions of iron tablets are easier on stomach. Vitamin C in orange juice or tablet form helps increase iron absorption.

Iron supplements can cause constipation, so should be taken with a stool softener or a laxative. Iron almost always turns stools black .

Treating causes other than poor diet
If iron supplements alone don't increase blood-iron levels in adults, it's likely the anemia is due to more than an iron-poor diet. It may be due to a source of bleeding or an iron-absorption problem. Depending on the cause, Treatment may involve :

- Medications such as oral contraceptives to lighten heavy menstrual flow
- Antibiotics to treat ulcers
- Surgery to remove a bleeding polyp, a tumor or a fibroid

If iron deficiency anemia is severe, blood transfusions can help replace iron and hemoglobin quickly.

Hemolytic anemia

Definition Hemolytic anemia is a condition where there are not enough red blood cells in the blood. It is caused by premature destruction of red blood cells. There are a number of specific types of hemolytic anemia, which are described individually.

Causes, incidence, and risk factors

Hemolytic anemia occurs when the bone marrow is unable to make up for premature destruction of red blood

cells by increasing their production. When the marrow is able to make up the loss, anemia does not occur.

There are many types of hemolytic anemia, which are classified by the location of the defect. The defect may be in the red blood cell itself (intrinsic factor), or outside the red blood cell (extrinsic factor).

Causes of hemolytic anemia include infection, certain medications, autoimmune disorders, and inherited disorders. **Types of hemolytic anemia include:**

- Sickle-cell anemia
- Paroxysmal nocturnal hemoglobinuria
- Hemoglobin SC disease (similar in symptoms to sickle-cell anemia)
- Hemolytic anemia due to G6PD deficiency (Favism)
- Hereditary elliptocytosis
- Hereditary spherocytosis
- Hereditary ovalocytosis
- Idiopathic autoimmune hemolytic anemia
- Non-immune hemolytic anemia caused by chemical or physical agents
- Secondary immune hemolytic anemia
- Thalassemia

Symptoms

- Chills
- Fatigue
- Pale skin color
- Shortness of breath
- Rapid heart rate
- Yellow skin color (jaundice)

- Dark urine
- Enlarged spleen

Signs and tests

These are tests for hemolysis (red blood cell destruction). There are specific tests which identify the specific types of hemolytic anemia. They are performed after hemolysis has been established.

- Elevated indirect bilirubin levels
- Low serum haptoglobin
- Hemoglobin in the urine
- Hemosiderin in the urine
- Increased urine and fecal urobilinogen
- Elevated absolute reticulocyte count
- Low red blood cell count (RBC) and hemoglobin
- Elevated serum LDH

Direct measurement of the red cell life span by radioactive tagging techniques shows a shortened life span.

Treatment

Treatment depends upon the type and cause of the hemolytic anemia. Folic acid, iron replacement, and corticosteroids may be used. In emergencies, transfusion of blood may be necessary.

Treatment depend on the type :

In Favism : Avoid all substances that cause hemolysis e.g. Soya beans , sulphonamides , antimalarials , analgesics ,... e.t.c .

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G6PD = Favism ملحوظة : ما هي الأشياء التي يمنع مريض

- ١- الطعمية - الفول - البسالة .
- ٢- جميع الأدوية الخافضة للحرارة ما عدا البارامول .
- ٣- جميع أدوية الإسهال التي تحتوى على السلفا .
- ٤- جميع الأدوية التي تحتوى على الكلور .
- ٥- أدوية علاج الملاريا .
- ٦- فيتامين ك الصناعي .
- ٧- رائحة النفطالين و الكلور .

In Thalassemia :

- Splenectomy
- Avoid excessive blood transfusion or iron preperations → hemochromatosis .
- R / Desferal 400mg vial .
٥, ١ جم بالعضل يوميا
(to remove excess iron) .

In Paroxysmal nocturnal hemoglobinuria :

- Avoid acidifying agent .
- Splenectomy
- Corticosteroids :

R / predilone 5 mg tab.

٤-٨ أقراص يوميا

- Oral iron :

R / Feroze tab.

قرص بعد الأكل مرتين يوميا

- I.V. heparin cautiously in thrombotic cases .

In spherocytosis : Splenectomy

In idiopathic autoimmune hemolytic anemia :

R / Hostacortin 5 mg tab.

٤-٨ أقراص يوميا حتى تتحسن الحالة ثم تخفض تدريجيا

قرص يوميا R / Folic acid 5 mg tab.

- Splenectomy if no response to steroids .

In sickle cell anemia : mentioned below .

Sickle cell anemia

Sickle cell anemia is an inherited form of anemia — a condition in which there aren't enough healthy red blood cells to carry oxygen throughout the body.

Under normal circumstances, red blood cells are flexible and round, and they move easily through blood vessels to carry oxygen to all parts of the body. In people with sickle cell anemia, the red blood cells become rigid and sticky and are shaped like sickles or crescent moons. These irregular-shaped blood cells die prematurely, resulting in a chronic shortage of red blood cells. Plus, they can get stuck when traveling through small blood vessels, which can slow or block blood flow and oxygen to certain parts of the body. This produces pain and can lead to serious complications.

There's no cure for most people with sickle cell anemia. However,

treatments can relieve pain and prevent further problems.

Signs and symptoms

People with sickle cell trait have one gene for the disease. They don't develop the disease and usually have no signs and symptoms.

People with sickle cell anemia have two genes for the disease — one from each parent. They usually show some signs and symptoms after four months of age. Some people with sickle cell anemia have mild symptoms. Others have severe symptoms and need frequent hospitalization.

Signs and symptoms of the disease include:

- Anemia. Sickle cells are fragile. They break apart easily and die, leaving the body chronically short on red blood cells to carry oxygen to tissues — a condition known as anemia. Without enough red blood cells in circulation, the body can't get the oxygen it needs to feel energized. That's why anemia causes fatigue.
- Episodes of pain. Periodic episodes of pain, called crises, are a major symptom of sickle cell anemia. Pain develops when sickle-shaped red blood cells block blood flow through tiny blood vessels to chest, abdomen and joints. Pain can also occur in bones. The pain may vary in intensity and can
- last for a few hours to a few weeks. Some people experience only a few episodes of pain. Others experience a dozen or more crises a year. If a crisis is severe enough, the patient may need hospitalization for painkillers to be injected into veins (intravenously).
- Hand-foot syndrome. Swollen hands and feet are often the first signs of sickle cell anemia in babies. The swelling is caused by sickle-shaped red blood cells blocking blood flow out of the hands and feet. Hand-foot syndrome is often accompanied by pain and fever.
- Jaundice. Jaundice is a yellowing of the skin and eyes that occurs because of liver damage or dysfunction. Occasionally, people who have sickle cell anemia have some degree of jaundice because the liver, which filters harmful substances from the blood, is overwhelmed مغمور by the rapid breakdown of red blood cells. In people with dark skin, jaundice is visible mostly as yellowing of the whites of their eyes.
- Frequent infections. Sickle cells can damage spleen, an organ that fights infection. This may make the patient more vulnerable ضعيف to infections. Doctors commonly give infants and children with sickle cell anemia antibiotics to prevent potentially life-threatening infections, such as pneumonia.

- Stunted growth إعاقة النمو.
Red blood cells provide the body with the oxygen and nutrients needed for growth. A shortage of healthy red blood cells can slow growth in infants and children and delay puberty in teenagers.
- Vision problems. Some people with sickle cell anemia experience vision problems. Tiny blood vessels that feed eyes may become plugged with sickle cells. This can damage the retina — the portion of each eye that processes visual images.

Causes

Sickle cell anemia is caused by a mistake in the gene that tells the body to make hemoglobin — the red, iron-rich protein that gives blood its red color. Hemoglobin is a component of every red blood cell in the body. It allows red blood cells to carry oxygen from lungs to all parts of the body, and to carry carbon dioxide waste from other parts of the body to lungs so that it can be exhaled.

Under normal circumstances, the body makes healthy hemoglobin known as hemoglobin A. People with sickle cell anemia make hemoglobin S — the S stands for sickle.

The sickle cell gene is passed from generation to generation in a pattern of inheritance called autosomal recessive inheritance. This means that *both* the mother and father must pass on the defective form of the gene for a child to be affected. Most

often, sickle cell disease is passed down the family tree by parents who have sickle cell trait.

People with sickle cell trait have one normal hemoglobin gene and one defective form of the gene. So their bodies make both normal hemoglobin and sickle cell hemoglobin. Their blood may contain some sickle cells, but they usually don't experience symptoms unless they're in an area with low oxygen — such as at high altitudes on an airplane or on a mountain. However, they are carriers of the disease, which means they can pass the defective gene on to their children.

Two carriers have a 25 percent chance of having an unaffected child with normal hemoglobin, a 50 percent chance of having a child who also is a carrier, and a 25 percent chance of having a child with sickle cell anemia. These chances are the same in each pregnancy.

Evolution of a defective gene
Researchers believe the defective hemoglobin gene that causes sickle cell anemia evolved many years ago, among people living in parts of Africa, the Mediterranean, the Middle East and India. At that time, malaria epidemics killed many people in those regions.

How defective hemoglobin causes anemia

Red blood cells with normal hemoglobin are smooth and round and glide through blood vessels. Red blood cells with defective hemoglobin may become hard, sticky and shaped

like a sickle used to cut wheat. These crescent-shaped cells can get stuck in small blood vessels, blocking blood flow and causing episodes of pain and damage to organs.

bone marrow (the red, spongy material found within the cavity of many of large bones) regularly produces red blood cells. Bone marrow also produces white blood cells to fight infections and platelets to help blood clot. These two types of blood cells aren't directly involved in sickle cell anemia.

Once red blood cells leave bone marrow, they normally live for about three to four months before they die and need to be replaced. However, sickle cells die after only 10 to 20 days. So, it's difficult for the body to produce enough replacements. The result is a chronic shortage of red blood cells, known as anemia.

Screening and Diagnosis

A blood test can check for hemoglobin S (the defective form of hemoglobin that underlies sickle cell anemia).

Additional steps

To confirm any Diagnosis, a sample of blood is examined under a microscope to check for large numbers of sickle cells — a marker of the disease.

- a blood test to check for anemia — a low red blood cell count.

Complications

Sickle cell anemia can lead to a host of complications, including:

- Stroke. A stroke can occur if sickle cells block blood flow to an area of the brain.
- Acute chest syndrome. This life-threatening complication of sickle cell anemia causes chest pain, fever and difficulty breathing..
- Organ damage. Sickle cells can block blood flow through blood vessels, immediately depriving **تحرّم** an organ of blood and oxygen. Chronic deprivation of oxygen-rich blood can damage nerves and organs in the body, including kidneys, liver and spleen. Organ damage can be fatal.
- Blindness. Tiny blood vessels that feed eyes can get plugged with sickle cells. Over time, this can damage the retina (the portion of each eye that processes visual images) and lead to blindness.
- Other complications. Sickle cell anemia can cause open sores, called ulcers, on legs. Sickle cells can block blood vessels that nourish skin, causing skin cells to die. Once skin is damaged, sores can develop. Gallstones also are a possible complication. The breakdown of red blood cells produces a substance called bilirubin. Bilirubin is responsible for yellowing of the skin and eyes (jaundice) in people with

sickle cell anemia. A high level of bilirubin in the body can also lead to gallstones. Men with sickle cell anemia may experience painful erections, a condition called priapism. Sick cells can prevent blood flow out of an erect penis. Over time, priapism can damage the penis and lead to impotence in men with sickle cell anemia.

Treatment

- Bone marrow transplant offers the only potential cure for sickle cell anemia. But very few people have a suitable donor for transplant.
- As a result, Treatment is usually aimed at avoiding crises, relieving symptoms and preventing complications. Also check red blood count. Treatments may include medications to reduce pain and prevent complications, blood transfusions and supplemental oxygen, as well as bone marrow transplant.

Medications

Medications used to treat sickle cell anemia include:

- Antibiotics. Children with sickle cell anemia need to start taking the antibiotic penicillin when they reach 2 to 4 months of age and continue until they're 5 years old. Doing so helps prevent infections such as pneumonia, which can be life-threatening to an infant or child

with sickle cell anemia.

Antibiotics may also help adults with sickle cell anemia fight certain infections.

- Pain-relieving medications. To relieve pain during a sickle crisis, using over-the-counter pain relievers and application of warm heat to the affected area.
- Hydroxyurea (Droxia, Hydrea). This prescription drug, normally used to treat cancer, may be helpful for adults with severe disease. When taken daily, it reduces the frequency of painful crises and may reduce the need for blood transfusions. It seems to work by stimulating production of fetal hemoglobin — a type of hemoglobin found in newborns that helps prevent the formation of sickle cells. There is some concern about the possibility that long-term use of this drug may cause tumors or leukemia.
- Blood transfusions. Blood transfusions increase the number of normal red blood cells in circulation, helping to relieve anemia. In children with sickle cell anemia at high risk of stroke, regular blood transfusions can cut the risk of a first or second stroke significantly.

Blood transfusions carry some risk. Blood contains the mineral iron. Regular blood transfusions cause an excess amount of iron to build up in the body. Because excess iron can damage heart, liver and other organs,

people who undergo regular transfusions must often receive Treatment to reduce iron levels.

Supplemental oxygen

It may be helpful if the patient has acute chest syndrome or a sickle cell crisis.

Bone marrow transplant

This procedure allows people with sickle cell anemia to replace their bone marrow — and its sickle-shaped red blood cells — with healthy bone marrow from a donor who doesn't have the disease. It can be a cure, but the procedure is risky, and it's difficult to find suitable donors. Researchers are still studying bone marrow transplants for people with sickle cell anemia. Currently, the procedure is only recommended for people who have significant symptoms and problems from sickle cell anemia.

Aplastic anemia

Coursing through bloodstream is a variety of blood cells — red blood cells, white blood cells and platelets. All are important to health. Red blood cells carry oxygen, white blood cells fight infection, and platelets help blood clot.

In aplastic anemia, the body stops producing enough new blood cells. This means patient is fatigued and at higher risk of infections and uncontrolled bleeding.

Signs and symptoms

- Fatigue
- Shortness of breath with exertion
- Rapid heart rate
- Pale skin
- Frequent or prolonged infections
- Unexplained or easy bruising
- Nosebleeds and bleeding gums
- Prolonged bleeding from cuts
- Skin rash

Causes

Bone marrow has a critical function. It contains special cells called stem cells, which are precursors of other cells. Stem cells in the bone marrow produce blood cells (red cells, white cells and platelets)that eventually leave the bone marrow and enter bloodstream. Stem cells also make more stem cells.

bone marrow needs to continually produce new blood cells of all types to replace old ones. Red blood cells live about four months, platelets about a week and most white blood cells a day or less before they're used and absorbed by the body.

Damage to bone marrow

Normally, bone marrow supplies the right numbers of blood cells to keep healthy. Aplastic anemia develops when damage occurs to bone marrow, slowing or shutting down the production of new blood cells — a serious problem. **Factors that can**

temporarily or permanently injure bone marrow include:

- High-dose radiation and chemotherapy Treatments. These cancer-fighting therapies kill cancer cells. But they also damage healthy cells, including stem cells in bone marrow. Secondary aplastic anemia can be a temporary side effect of these Treatments.
- Exposure to toxic chemicals. Secondary aplastic anemia has been linked to exposure to toxic chemicals, such as some used in pesticides and insecticides. Exposure to benzene — an ingredient in gasoline, mothballs, paint and varnish removers, dry-cleaning solutions, and some glues and household cleaners — also has been linked to secondary aplastic anemia. This type of anemia sometimes gets better on its own if patient avoids repeated exposure to the chemicals that caused the initial illness.
- Use of certain drugs. Some medications to treat rheumatoid arthritis, some antibiotics, as well as some illegal drugs can cause secondary aplastic anemia.
- Autoimmune disorders. An autoimmune disorder such as lupus, in which the body's immune system begins attacking healthy cells, may involve stem cells in the bone marrow.

- A viral infection. In some people, aplastic anemia may be related to a viral infection that affects the bone marrow.
- Pregnancy. Aplastic anemia may occur in pregnancy, but this is rare. It may be related to an autoimmune problem — the body's immune system begins attacking the bone marrow during pregnancy.
- Bone marrow diseases. Diseases that affect bone marrow can eventually lead to an added Diagnosis of aplastic anemia.
- Unknown factors. In about half of cases, doctors aren't able to identify the cause of aplastic anemia. This is called idiopathic aplastic anemia.

Screening and Diagnosis

- Blood tests.
- Bone marrow biopsy.

Treatment

Blood transfusions

Most people with aplastic anemia require multiple blood transfusions — transfusions of red blood cells or platelets, or both. Blood transfusions aren't a cure for aplastic anemia. But they do relieve symptoms by providing blood cells that bone marrow isn't producing.

Immune-suppressing drugs

Aplastic anemia may be due to an autoimmune disorder that's causing

body's immune system to attack and damage cells in bone marrow. To prevent this from continuing, doctors sometimes treat aplastic anemia with drugs that alter or suppress the immune system.

Drugs such as cyclosporine (Gengraf, Neoral, Sandimmune) and anti-thymocyte globulin (Thymoglobulin) are examples. These drugs suppress the activity of immune cells that are damaging bone marrow. This helps bone marrow recover and generate new blood cells. Cyclosporine and anti-thymocyte globulin are often used in combination. This option is usually the Treatment of choice for older people with aplastic anemia and for those without a matching donor for bone marrow transplant.

Corticosteroids, such as methylprednisolone (Medrol, Solu-Medrol), are often given at the same time as these drugs to lessen their side effects.

Immune-suppressing drugs can be very effective at treating aplastic anemia. The downside is that these drugs further weaken immune system. It's also possible that after stop taking these drugs, aplastic anemia may return.

Bone marrow transplantation

Bone marrow transplantation may offer the only successful Treatment option for people with severe aplastic anemia.

Antibiotics

Having aplastic anemia weakens immune system. patient have fewer

white blood cells in circulation to fight off germs. This leaves patient susceptible to all kinds of infections — everything from colds to more-serious illnesses.

- **Male hormones.**
Researchers are investigating a synthetic version of the male hormone androgen as atreatment for aplastic anemia. The drug, which also stimulates blood cell production
- **Peripheral stem cell transplants.**

Acute lymphocytic leukemia (ALL)

Definition Acute lymphocytic leukemia is a progressive, malignant disease characterized by large numbers of immature white blood cells that resemble lymphoblasts. These cells can be found in the blood, the bone marrow, the lymph nodes, the spleen, and other organs.

Causes, incidence, and risk factors

Acute lymphocytic leukemia (ALL) accounts for 80% of the acute leukemias of childhood, with most cases occurring between ages 3 and 7. ALL also occurs in adults, where it accounts for 20% of all adult leukemias.

In acute leukemia, the malignant (cancerous) cell loses its ability to mature and specialize (differentiate) its function. These cells multiply rapidly and replace the normal cells. Bone marrow failure occurs as

malignant cells replace normal bone marrow elements. The person becomes susceptible to bleeding and infection because the normal blood cells are reduced in number.

Most cases seem to have no apparent cause. However, radiation, some toxins such as benzene, and some chemotherapy agents are thought to contribute to brining on leukemia. Abnormalities in chromosomes may also play a role in the development of acute leukemia.

Symptoms

- Prolonged or excessive bleeding, bruising easily
- Bleeding gums
- Nosebleeds
- Bleeding into the skin
- Menstrual irregularities
- Skin rash or lesion
 - Pinpoint red spots (petechiae)
 - Bruises (ecchymoses)
- Paleness
- Fatigue
- Infection
- Sternal tenderness
- Bone pain or tenderness
 - Breastbone (sternum)
- Joint pain
 - Hip pain
 - Knee pain
 - Ankle pain
 - Foot pain over small joints of the foot
 - Shoulder pain
 - Elbow pain
 - Wrist pain
 - Hand pain over small joints of the hand

- Lymphadenopathy (enlarged glands)
- Unintentional weight loss
- Fever
- Swollen gums
- Shortness of breath (made worse by exercise)
- Sensations of feeling the heart beat (palpitations) with an irregular pattern

Signs and tests

A physical exam and lab tests may reveal the following:

- Enlarged liver and spleen
- Bruising (ecchymosis)
- Evidence of bleeding (petechiae, purpura)
- Abnormal WBC count
- A CBC shows anemia
- Low platelet count
- A bone marrow aspiration shows an increased number of cells (hypercellularity) and an increase in lymphoblasts.

ALL may also alter the results of the following tests:

- T (thymus derived) lymphocyte count
- Cell surface antigen studies (B-cell, leukemia/lymphoma panel)
- White blood cell differential

Classification of ALL now depends on a number of sophisticated tests, such as immunophenotyping, karyotyping, and terminal deoxynucleotidyltransferase (TdT) activity. The combined results of these tests allow pinpoint molecular

diagnosis, which helps guide the treatment decisions, and clarify the likely prognosis.

For instance, the cells of some leukemias contain chromosomal abnormalities. Those with the Philadelphia chromosome or with the t(4;11) translocation would tend to have a poor prognosis, thus intensive treatment and an early bone marrow transplant might be recommended immediately. Other genes (such as the TEL/AML1 rearrangement) can indicate a very favorable prognosis.

Treatment

The goal of treatment is remission of the cancer. A remission is achieved when the peripheral blood counts and the bone marrow are normal.

Acute lymphocytic leukemia is treated with a combination of anti-cancer drugs (chemotherapy). A hospitalization of 3 to 6 weeks may be necessary for initial (induction) chemotherapy, however, subsequent chemotherapy sessions may be given on an outpatient basis. Additionally, the patient may need to be isolated if the lymphocyte count is very low to prevent catching an infection.

Chemotherapy typically consists of a combination of 3 to 8 medications which may include: prednisone, vincristine, methotrexate, 6-mercaptopurine, and cyclophosphamide. It may also be necessary to administer blood products (e.g., packed red blood cells, platelets) to treat the anemia and low platelet count. Antibiotic therapy may

be required to treat any secondary infections that develop.

After remission is achieved, chemotherapy or radiation therapy may be given in the spinal column to treat any leukemia cells that may have invaded the spinal fluid.

Subsequent therapy is meant to prevent relapse and consists of additional chemotherapy given intermittently, either in the hospital or as an outpatient. This treatment may last up to one year. A bone marrow transplant after high-dose chemotherapy may be a treatment option for cases that relapse or do not respond to other treatment s.

Acute myeloid leukemia (AML) Or Acute granulocytic leukemia (AGL)

Definition Acute myelogenous leukemia (AML) is a cancer of blood-forming tissues of the bone marrow. It involves the growth of immature white blood cells.

There are 8 categories of AML, categorized as M0 to M7, based on which blood cells are abnormal.

Causes, incidence, and risk factors

Acute myelogenous leukemia (AML) may occur at any age, but generally occurs in people about age 65. (It may also affect children younger than age 1.)

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AML is rarely seen in people younger than 40. A 50 year old has a 1 in 25,000 chance of developing AML. A 70 year old has a 1 in 7,000 chance. The cancer is more common in men than women.

During AML, defective cells in the bone marrow multiply rapidly and replace healthy blood cells.

Bone marrow failure occurs as cancerous cells replace normal bone marrow. The bone marrow is part of the body's immune system. Problems with the immune system can make it harder for the body to fight infection. Patients with AML have an increased risk of bleeding as healthy blood cells drop. They become more prone to infection as the immune system loses its ability to fight off dangerous substances.

In most cases, a cause can not be determined. However, the following are thought to cause some types of leukemia, including AML:

- Radiation
- Dangerous chemicals such as benzene
- Certain chemotherapy drugs, including etoposide and drugs known as alkylating agents

Gene defects may also play a role in the development of AML.

Symptoms

- Prolonged bleeding, bruising easily
- Bleeding gums
- Bleeding from the nose

- Menstrual periods, abnormal
- Skin rash or lesion
- Fatigue
- Fever
- Bone pain or tenderness
- Weight loss
- Swollen gums (rare)
- Shortness of breath aggravated by exercise
- Paleness

Signs and tests

A physical examination may show signs of anemia, pallor, and bleeding. Less commonly, there may be signs of an enlarged spleen, liver, or lymph nodes.

A complete blood count (CBC) shows anemia and a low number of platelets. A white blood cell count (WBC) can be high, low, or normal.

Bone marrow aspiration will show if there are any leukemia cells.

Treatment

The goal of treatment is to kill the cancer cells with chemotherapy. Unfortunately, chemotherapy also harms normal cells. This raises the risk for side effects, such as excessive bleeding caused by low numbers of platelets and infection caused by a low white blood count. It takes several weeks for the bone marrow to recover and start producing normal cells.

Other treatment involves:

- Isolating the patient to prevent infection
- Antibiotics to treat infection

- Transfusions of platelets to control bleeding
- Red blood cell transfusions to fight anemia

After remission is achieved, further treatment called consolidation is necessary to achieve a permanent cure. Consolidation may consist of additional chemotherapy, a bone marrow transplant, or a stem cell transplant. Transplants may also be performed in those whose disease has come back.

Chronic lymphocytic leukemia (CLL)

Definition Chronic lymphocytic leukemia is cancer of the white blood cells (lymphocytes).

Causes, incidence, and risk factors

Chronic lymphocytic leukemia (CLL) causes a slow increase in the number of B lymphocytes in the bone marrow. The cancerous cells spread from the blood marrow to the blood, and can also affect the lymph nodes and other organs. CLL causes the bone marrow to fail and weakens the immune system.

The reason for this increase in B lymphocytes is unknown. There is no link to radiation, cancer-causing chemicals, or viruses.

Usually, the symptoms develop gradually. Many cases are detected by routine blood tests in people with no symptoms.

CLL primarily strikes adults. The average age of a patient with this type of leukemia is 70. It is rarely seen in people younger than 40. The disease is more common in Jewish people of Russian or East European descent, and is uncommon in Asia.

Symptoms

- Enlarged lymph nodes, liver, or spleen
- Fatigue
- Abnormal bruising (occurs late in the disease)
- Excessive sweating, night sweats
- Loss of appetite
- Unintentional weight loss

Signs and tests

Patients with CLL have a higher-than-normal white blood cell count.

Tests to diagnose CLL include:

- CBC
- Flow cytometry
- Bone marrow aspiration
- Serum protein electrophoresis

Treatment

Chemotherapy may be needed if fatigue, anemia, thrombocytopenia, or lymph node swelling occurs. Several chemotherapy drugs are commonly used to treat CLL. A common drug used is chlorambucil (Leukeran). Fludarabine and cyclophosphamide (Cytosan) may also be used.

R / Leukeran (chlorambucil) 2.5 mg tab.

٠,١ - ٠,١٥ مجم / كجم / يوميا و يستمر حتى تحدث إستجابة ثم تقلل الجرعة .

Rituximab (Rituxan), may also be used alone or in combination with traditional chemotherapy. Alemtuzumab (Campath) is approved for treatment of patients with CLL that have not responded to fludarabine.

- Rarely, radiation may be used for enlarged lymph nodes. Blood transfusions or platelet transfusions may be required. Stem cell transplantation may be used in advances stages of CLL.

Chronic myeloid leukemia (CML)

Or Chronic granulocytic leukemia (CGL)

Definition Chronic myelogenous leukemia is cancer of the bone marrow.

Causes, incidence, and risk factors

CML can occur in adults (usually middle-aged) and children. The disease affects 1 to 2 people per 100,000 and accounts for 7 - 20% cases of leukemia. It is usually associated with a chromosome abnormality called the Philadelphia chromosome.

CML causes rapid growth of the blood-forming cells (myeloid

precursors) in the bone marrow, peripheral blood, and body tissues.

Exposure to ionizing radiation is one possible trigger for this chromosome abnormality. Such exposure could occur from a nuclear disaster كارثة or from treatment of a previous cancer, like thyroid cancer or Hodgkin's lymphoma. However, the vast majority of people treated for cancer with radiation do not go on to develop leukemia. It takes many years to develop leukemia from this cause.

Symptoms

Chronic myelogenous leukemia is grouped into several phases.

The chronic phase that can last for months or years. The disease may have few or no symptoms during this time. Most people are diagnosed by during this stage, when they are being tested for something else.

The accelerated phase is a more dangerous phase, during which the leukemia cells grow more quickly. Acceleration of the disease may be associated with fever (without infection), bone pain, and a swollen spleen.

If untreated, CML progresses to the blast crisis phase. This phase is very difficult to treat and is marked by a very high count of immature white blood cells (leukemia cells). Bleeding and infection may occur due to bone marrow failure.

Other possible symptoms include:

- Fatigue

- Weakness
- Excessive sweating (night sweats)
- Low-grade fever
- Pressure under the left ribs from an swollen spleen
- Bleeding and bruising
- Sudden appearance of small red marks on the skin (petechiae)

Signs and tests

A physical examination often reveals an enlarged spleen. A CBC shows an increased number of white blood cells.

Other tests that may be done include:

- CBC differential
- Bone marrow aspiration
- Testing for the presence of the Philadelphia chromosome
- Molecular assay for the bcr-abl gene

Treatment

Imatinib (Gleevec) is the first line of therapy for all patients. Gleevec blocks the Philadelphia chromosome and is associated with very high rates of remission. Similar drugs are being developed.

Sometimes a chemotherapy medicine called hydroxyurea (Hydrea) is used temporarily to control the white blood cell count.

The only known cure for CMS is a bone marrow transplant or stem cell transplantation.

Hodgkin's lymphoma

Definition Hodgkin's lymphoma is a malignancy (cancer) of lymph tissue found in the lymph nodes, spleen, liver, and bone marrow.

Causes, incidence, and risk factors

The first sign of this cancer is often an enlarged lymph node which appears without a known cause. The disease can spread to nearby lymph nodes and later may spread to the lungs, liver, or bone marrow.

The cause is not known. Hodgkin's lymphoma is most common among people 15 to 35 and 50 to 70 years old.

Symptoms

- Painless swelling of the lymph nodes in the neck, armpits, or groin (swollen glands)
- Fatigue
- Fever and chills
- Night sweats
- Weight loss
- Loss of appetite
- Generalized itching

Additional symptoms that may be associated with this disease:

- Excessive sweating
- Skin blushing or flushing
- Neck pain
- Hair loss
- Flank pain
- Clubbing of the fingers or toes
- Splenomegaly

Signs and tests

- ACE levels

The disease may be diagnosed after:

- A lymph node biopsy
- A bone marrow biopsy
- A biopsy of suspected tissue
- Detection of Reed-Sternberg (Hodgkin's lymphoma) cells by biopsy

A staging evaluation (tumor staging) may be done to determine the extent of the disease. The following procedures may be done:

- Physical examination
- CT scans of the chest, abdomen, and pelvis
- Bone marrow biopsy
- Blood chemistry tests
- PET scan

In some cases, abdominal surgery to take a piece of the liver and remove the spleen may be needed. However, because the other tests are now so good at detecting the spread of Hodgkin's lymphoma, this surgery is usually unnecessary.

Hodgkin's lymphoma may change the results of the following tests:

- Lymphocyte count
- Small bowel biopsy
- Schirmer's test
- Peritoneal fluid analysis
- Mediastinoscopy with biopsy
- Gallium scan
- Ferritin
- Cytology exam of pleural fluid
- Cryoglobulins
- Bone marrow aspiration
- Blood differential

Treatment

A staging evaluation is necessary to determine the treatment plan.

- Stage I indicates one lymph node region is involved (for example, the right neck).
- Stage II indicates involvement of 2 lymph nodes on the same side of the diaphragm (for example, both sides of the neck).
- Stage III indicates lymph node involvement on both sides of the diaphragm (for example, groin and armpit).
- Stage IV involves the spread of cancer outside the lymph nodes (for example, to bone marrow, lungs, or liver).

Treatment varies with the stage of the disease.

- Stages I and II (limited disease) can be treated with localized radiation therapy, with chemotherapy or with a combination of both.
- Stages III and IV (extensive disease) are treated with chemotherapy alone or a combination of radiation therapy and chemotherapy.

The following therapeutic regimen is effective :

R / Mustargen HCL 10 mg vials . ٦
مجم لكل متر مربع بالوريد في اليومين الأول و
الثامن

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R / Velbe (Vinblastine) 10 mg vials .
٦ مجم لكل متر مربع بالوريد في اليومين الأول و
الثامن

R / Natulan (Procarbazine) 50 mg.
Cap.

١٠٠ مجم لكل متر مربع خلال الأيام من الأول إلى
الرابع عشر

R / Hostacortin 5 mg tab. ٨ أقراص لكل
متر مربع خلال الأيام من الأول حتى الرابع عشر

Chemotherapy can cause low blood cell counts, which can lead to an increased risk of bleeding, infection, and anemia. To minimize bleeding, apply ice and pressure to any external bleeding.

Jaundice الصفراء

What is jaundice?

Jaundice is not an illness, but a medical condition in which too much bilirubin – a compound produced by the breakdown of hemoglobin from red blood cells – is circulating in the blood. This excess of bilirubin causes the skin, eyes, and the mucus membranes (inside of the mouth) to turn a yellowish color. This yellowish color is due to the bilirubin dissolving in the fat layer just below the skin.

Jaundice is common in newborn babies and will usually clear without treatment. However, for adults the symptoms of jaundice usually indicate damage to the liver. If the

cause of the jaundice is not treated, liver failure can result.

What causes jaundice?

Jaundice may be caused by a number of factors such as:

- An obstruction of the bile duct, often due to a tumor or gallstone
- Hepatitis: an inflammation of the liver
- Biliary stricture: a narrowing of the duct that transports bile from the liver to the small intestine
- Cirrhosis: a slowly progressing disease in which healthy liver tissue is replaced with scar tissue, eventually preventing the liver from functioning properly
- Pancreatic cancer
- Inadequate blood flow to the liver
- Congenital disorders involving bilirubin
- Malaria: a serious and sometimes fatal disease in humans caused by a parasite transmitted by mosquitoes

What are the symptoms often accompanying jaundice?

- Yellow discoloring of the skin, whites of the eyes (sclera), and mucus membranes
- Dark urine
- Nausea
- Itching
- Light-colored stool (gray or yellow)
- Abdominal pain or swelling

How is jaundice diagnosed?

By :

- Physical examination. However, because the condition has a number of possible causes, the following tests for adults may be needed :

- 1-Serum bilirubin: A test that measures the concentration of bilirubin in the blood.
- 2-Complete blood count: A series of blood tests that provides information about the components of blood including red blood cells, white blood cells, and platelets.
- 3-Prothrombin time: A test that measures the blood's clotting ability
- 4-Abdominal ultrasound: An abdominal ultrasound uses high-frequency sound waves to produce a "picture" called a sonogram. A sonogram of the liver will show whether it is swollen or abnormal.
- 5-Liver biopsy: A test where a small sample of the liver's tissue is removed and then analyzed in a laboratory.

How is jaundice treated?

Since jaundice is a symptom, not a specific disorder, treatment for it depends on its cause. This can range from the removal of gallstones or tumors to antibiotics to treat infections, to liver transplant in cases where the liver is severely damaged. However, for conditions like cirrhosis and chronic hepatitis, which are lifelong problems, jaundice may be permanent or recurring.

**Atlas-8
2007**

**جميع الادوية مرتبة
A-Z ابدياً**

**لان جميع الادوية مرتبة ابدياً
يسهل لك متابعة النواقص
وترتيب الدواء على الرفوف**

**يسهل لك الوصول لى دواء
بسهولة وكذلك استعماله باللغة
العربية لان جميع الادوية مرتبة
الفابيكال**

**مرجع باللغة العربية لاهم
الامراض وعلاجها
٤٠٠ صفحة - ٢٠ جنيهاً**

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Endocrine disorders

Diabetic ketoacidosis

Definition Diabetic ketoacidosis is a complication of diabetes. It is caused by the buildup of by-products of fat breakdown, called ketones. This occurs when glucose is not available as a fuel source for the body, and fat is used instead.

Causes, incidence, and risk factors

People with diabetes lack enough insulin, a hormone the body uses to process glucose (a simple sugar) for energy. When glucose is not available, body fat is broken down instead. The by-products of fat metabolism are ketones. When fat is metabolized, ketones build up in the blood and "spill" over into the urine. A condition called ketoacidosis develops when the blood becomes more acidic than body tissues.

Blood glucose levels rises (usually higher than 300 mg/dL) because the liver produces glucose to try to combat the problem, but the cells cannot take up that glucose without insulin. Diabetic ketoacidosis may lead to the initial diagnosis of type 1 diabetes, as it is often the first symptom that causes the person to come to medical attention. It can also be the result of increased insulin needs in someone already diagnosed with type 1 diabetes. Infection,

trauma, heart attack, or surgery can lead to diabetic ketoacidosis in such cases.

People with type 2 diabetes usually develop ketoacidosis only under conditions of severe stress. Not following the prescribed diet and treatment is usually the cause when episodes are repeated.

Symptoms

- Frequent urination or frequent thirst for a day or more
- Fatigue
- Nausea and vomiting
- Muscular stiffness or aching
- Mental stupor that may progress to coma
- Rapid breathing
- Fruity breath (breath odor) رائحة الفواكه أو الأسيتون

Additional symptoms that may be associated with this disease:

- Headache
- Decreased consciousness
- Breathing difficulty while lying down
- Low blood pressure
- Decreased appetite
- Abdominal pain

Signs and tests

- Low blood pressure

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- Rapid heart rate
- Signs of dehydration
- High blood glucose (above 300 mg/dL)
- Presence of glucose and ketones in urine by home or office testing
- Serum potassium (may be elevated)
- Serum amylase (may be elevated)
- Arterial blood gas (reveals pH of less than 7.3)

This disease may also alter the results of the following tests:

- Urine pH
- Sodium - urine
- Serum sodium
- Potassium - urine
- Serum phosphorus
- Serum magnesium
- CSF collection
- CO₂

Treatment

The goal of treatment is to correct the elevated blood glucose level by giving additional insulin, and to replace fluids lost through excessive urination and vomiting. A person with diabetes may be able to recognize the early warning signs and make appropriate corrections at home, before the condition progresses.

If ketoacidosis is severe, hospitalization is required to control the condition. Insulin replacement will be given, fluid and electrolytes will be replaced, and the cause of the condition (such as infection) will be identified and treated.

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1- Soluble or Crystalline insulin :

R / Actrapid insulin . i.m. يحقن بالعضل حسب مستوى السكر في البول والدم

- If B.S > 40 mmol/L (750mg / 100ml) : give 10 units i.m./hr
- If B.S. < 40 mmol/L : give 5 units i.m. / hr .

Continue this regimen until B.S. falls to 250mg / 100ml . adjust the dose of soluble insulin to be given at 4 – hourly intervals .

- Dose of soluble insulin depending on the urine glucose content :

Urine glucose	Insulin dose
2 % or above (+ + + +)	24 units .
1% (+ + +)	16 units .
3/4 % (+ +)	12 units
1/2% (+) or –ve	8 units.

2- Fluid replacement :

R / Saline 0.9% لتر واحد بالوريد
بالنقطة على مدى نصف ساعة ثم لتر على مدى
الساعة التالية ثم لتر كل 4-6 ساعات

3- Potassium supplement :

R / KCL solution . (26 mmol is added to each litre of infused fluid) .

4- Correction of acidosis (Plasma HCO₃ < 12 mEq / L) by :

R / NaHCO₃ 8.4% solution .

- If blood PH is 7-7.1 : give 50 ml i.v. over 1 hr . ٥٠ سم^٣ بالوريد على مدى ساعة
- If blood PH is < 7 give 100ml i.v. over 1 hr . ١٠٠ سم^٣ بالوريد على مدى ساعة

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N.B. Normal PH (7.36 -7.44) .the range which patient can survive within is 7.8-6.8 since alkalinity is more dangerous , correction of acidosis must be gentle .

5- When blood glucose falls to 300mg/100ml saline infusion is replaced by :

R / Dextrose 5 % solution . (1 litre + 26mmol KCL / 6hrs) .

يحقن بالوريد بالنقطة كل ٦ ساعات

6- NGT gastric Aspiration half hourly .
Avoid administration of fluids via NGT .
شفط إفرازات المعدة من خلال الأنبوية

7- Treatment of infection :

R /Cefotax 1 gm vial .

حقنة عضل أو ورید كل ٦ ساعات

Non-Ketotic hyperglycemic coma

Treatment :

- 1- Frequent injection of Crystalline insulin to adjust blood glucose .
- 2- Fluid replacement .
- 3- Treating the cause .

Diabetes mellitus

What is diabetes?

Diabetes is a disease in which blood glucose levels are above normal. People with diabetes have problems converting food to energy. After a meal, food is broken down into a sugar called glucose, which is carried

Endocrine disorders

by the blood to cells throughout the body. Cells use insulin, a hormone made in the pancreas, to help them convert blood glucose into energy.

People develop diabetes because the pancreas does not make enough insulin or because the cells in the muscles, liver, and fat do not use insulin properly, or both. As a result, the amount of glucose in the blood increases while the cells are starved of energy. Over the years, high blood glucose, also called hyperglycemia, damages nerves and blood vessels, which can lead to complications such as heart disease and stroke, kidney disease, blindness, nerve problems, gum infections, and amputation.

Types of Diabetes

The three main types of diabetes are type 1, type 2, and gestational diabetes.

- Type 1 diabetes, formerly called juvenile diabetes, is usually first diagnosed in children, teenagers, or young adults. In this form of diabetes, the beta cells of the pancreas no longer make insulin because the body's immune system has attacked and destroyed them.
- Type 2 diabetes, formerly called adult-onset diabetes, is the most common form. People can develop it at any age, even during childhood. This form of diabetes usually begins with insulin resistance, a condition in which muscle, liver, and fat cells do not use

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insulin properly. At first, the pancreas keeps up with the added demand by producing more insulin. In time, however, it loses the ability to secrete enough insulin in response to meals.

- Gestational diabetes develops in some women during the late stages of pregnancy. Although this form of diabetes usually goes away after the baby is born, a woman who has had it is more likely to develop type 2 diabetes later in life. Gestational diabetes is caused by the hormones of pregnancy or by a shortage of insulin.

Former Names	Preferred Names
Type I juvenile diabetes insulin-dependent diabetes mellitus IDDM	type 1 diabetes
Type II adult-onset diabetes noninsulin-dependent diabetes mellitus NIDDM	type 2 diabetes

What is pre-diabetes?

In pre-diabetes, blood glucose levels are higher than normal but not high enough to be characterized as diabetes. However, many people with pre-diabetes develop type 2 diabetes within 10 years. Pre-diabetes also increases the risk of heart disease and stroke. With modest weight loss and moderate physical activity,

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people with pre-diabetes can delay or prevent type 2 diabetes.

How are diabetes and pre-diabetes diagnosed?

The following tests are used for diagnosis:

- A fasting plasma glucose test measures blood glucose after patient has gone at least 8 hours without eating. This test is used to detect diabetes or pre-diabetes.

Table 1. Fasting Plasma

Glucose Test

Plasma Glucose Result (mg/dL)	Diagnosis
99 and below	Normal
100 to 125	Pre-diabetes (impaired fasting glucose)
126 and above	Diabetes*

- An oral glucose tolerance test measures blood glucose after patient has gone at least 8 hours without eating and 2 hours after he drinks a glucose-containing beverage. This test can be used to diagnose diabetes or pre-diabetes.

Table 2. Oral Glucose Tolerance Test

2-Hour Plasma Glucose Result (mg/dL)	Diagnosis
139 and below	Normal
140 to 199	Pre-diabetes (impaired)

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	glucose tolerance)
200 and above	Diabetes*

- In a random plasma glucose test, check blood glucose without regard to the last meal. This test, along with an assessment of symptoms, is used to diagnose diabetes but not pre-diabetes.

Symptoms : increased urination

- increased thirst
- unexplained weight loss

Other symptoms include fatigue, blurred vision, increased hunger, and sores that do not heal.

Positive test results should be confirmed by repeating the fasting plasma glucose test or the oral glucose tolerance test on a different day.

What factors increase patient risk for type 2 diabetes?

- He is 45 or older.
- He is overweight or obese.
- He has a parent, brother, or sister with diabetes.
- He has had gestational diabetes.
- His blood pressure is 140/90 or higher.

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- His cholesterol levels are not normal. His HDL cholesterol ("good" cholesterol) is 35 or lower, or his triglyceride level is 250 or higher.
- He is fairly inactive. He exercises fewer than three times a week.

symptoms of hyperglycemia, such as:

- Increased thirst
- Increased urination
- Fatigue
- Blurred vision
- Slow-healing infections

or symptoms of hypoglycemia, such as:

- Sweating
- Hunger
- Trembling
- Anxiety
- Confusion
- Blurred Vision

Some of the other diseases and conditions that can result in elevated glucose levels include:

- 1- Acromegaly
- 2- Acute stress (response to trauma, heart attack, and stroke for instance)
- 3- Chronic renal failure
- 4- Cushing syndrome
- 5- Drugs, including: corticosteroids, tricyclic antidepressants, diuretics, epinephrine, estrogens (birth control pills and hormone replacement), lithium,

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phenytoin (Dilantin),
salicylates,

- 6- Excessive food intake
- 7- Hyperthyroidism
- 8- Pancreatic cancer
- 9- Pancreatitis

Low to non-detectable urine glucose results are considered normal.

Anything that raises blood glucose levels also has the potential to elevate urine glucose levels.

Increased urine glucose levels may be seen with medications, such as estrogens and chloral hydrate, and with some forms of renal disease.

Moderately increased levels may be seen with pre-diabetes. This condition, if left un-addressed, often leads to type 2 diabetes.

Low glucose levels (hypoglycemia) are also seen with:

- Adrenal insufficiency
- Drinking alcohol
- Drugs, such as acetaminophen and anabolic steroids
- Extensive liver disease
- Hypopituitarism
- Hypothyroidism
- Insulin overdose
- Insulinomas (insulin-producing pancreatic tumors)
- Starvation

Treatment :

إتباع نظام غذائي مخصص لمرض السكر

Type 1 (Insulin-dependant diabetes mellitus or juvenile diabetes mellitus) :

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Type 1 is the type of diabetes that people most often get before 30 years of age. All people with type 1 diabetes need to take insulin (*IN-suh-lin*) because their bodies do not make enough of it. Insulin helps turn food into energy for the body to work.

1- By trial : start by 10 U. (0.5 cc.) S.C. before each meal , gradually increase by 10 U. every other day until glycosuria is controlled .calculate the total dose given/ day . Give this dose once daily in the morning as : (1/3 Crystalline & 2 /3 protamin zinc insulin) . for example if 60 units of insulin are needed daily to control glycosuria , this amount could be given once as 1 cc. Crystalline insulin (20 U.) + 1 cc. Protamin zinc insulin (40 U.) S.C. 30 min. before breakfast .

OR :

2- Give one unit insulin for each 2 gms of glucose lost in urine . for example , if one loses 120 gms of glucose in urine daily , the required dose of insulin will be 60 units daily .

OR :

3- Give 1/ 4 the fasting blood sugar in units . for example if the fasting blood sugar is 160 , the required dose of insulin will be 40 units daily .

R / Actrapid 20 U / ml vials .

يحقن ثلث الجرعة اليومية تحت الجلد قبل الإفطار يوميا

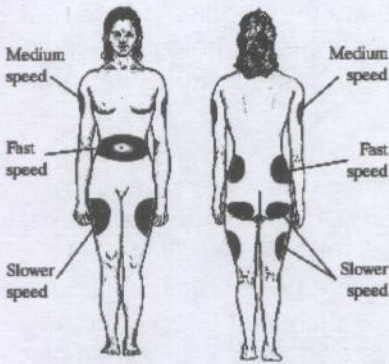
R / Mixtard 40 U/ml vials :

يحقن ٣/٢ الجرعة اليومية تحت الجلد قبل الإفطار يوميا

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Endocrine disorders

These are good places to give insulin shots



Diabetes Treatment: Medications for type 2 diabetes

Healthy lifestyle choices — including diet, exercise and weight control — are an important part of diabetes Treatment. If patient has type 2 diabetes, sometimes medication to control blood sugar is needed, too. Here's a comparison of various types of oral and injectable diabetes medications. Sometimes a single medication is effective. In other cases, a combination of medications works better.

Medication	How it's taken	How it works	Advantages
Alpha-glucosidase inhibitors e.g. Acarbose	By mouth Three times a day, at each meal	Slows absorption of sugar into bloodstream after eating carbohydrates	Limits the rapid rise of blood sugar that can occur after meals; may promote weight loss
Biguanides e.g. Metformin (Glucophage)	By mouth Two or three times a day. With meal	Reduces the amount of sugar that liver releases into bloodstream between meals	May promote weight loss; may reduce cholesterol and triglycerides
Meglitinides e.g. Repaglinide - nateglinide	By mouth with each	Stimulates pancreas to release more insulin when	Works quickly when taken with meals; less likely than sulfonylureas to cause low

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Endocrine disorders

(Starlix)	meal 1 to 30 minutes before a meal .	blood sugar levels rise after eating	blood sugar
Sulfonylureas e.g. Glipizide - glyburide - glimepiride (Amaryl)	By mouth once daily before breakfast & others taken twice daily	Stimulates pancreas to release more insulin	Combines well with other oral diabetes drugs for maximum effect on blood sugar
Thiazolidinediones e.g. Rosiglitazone (Avandia) - pioglitazone	By mouth	Makes tissues more sensitive to insulin	Taken only once or twice a day with or without food

Sometimes two kinds of medicines are given together. For example, glyburide combined with metformin (brand name: Glucovance), glipizide combined with metformin (brand name: Metaglip) and rosiglitazone combined with metformin (brand name: Avandamet).

Or : Adenoplex Amp.

Or : Epinosine-B forte amp.

الحقن : حقنة بالعضل يوم بعد يوم . الأقراص : قرص ٣ مرات يوميا

عناية مريض السكر بالقدمين

الجرعة بالنسبة للأقراص حسب الحالة

In both types , the following is recommended :

- * Vitamins : Ampoules or tab.
- Contain B vitamin . or adenosine triphosphate .
- R/ becozym amp.
- Or : Neuroton Amp. Or tab.**
- Or : Neurobion Amp. Or Tab.**
- Or : neurovit Amp. Or Tab.**
- Or : Tri-B Amp. Or tab.**

يتم غسل القدمين يوميا بالماء الدافئ و الصابون مع تجفيفهما جيدا خاصة بين الأصابع ، كما يجب مراعاة اختبار حرارة الماء قبل استخدامها إذ قد تسبب حرقا للجلد .
يتم فحص القدمين يوميا و خاصة المقدمة ، الجانبين ، الكعب و بين الأصابع و استشارة الطبيب عند ظهور أى تقرحات أو تغيرات أو علامات للتلوث .
يجب إرتداء جوارب و خاصة فى الطقس البارد تجنباً لحدوث لسعة البرد على أن تكون جوارب نظيفة و تجنب رباطات الجوارب التى تضغط على الساقين و المزودة برباط من أعلاها .

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يتم وضع كريم مرطب على القدمين بعد غسلهما
إذ أن جلد مريض السكر يكون جافاً وقد يتشقق مما
قد يؤدي إلى الإصابة بالميكروبات .
كما ينبغي المحافظة على القدمين بإرتداء الحذاء
المناسب و المريح أيضاً ، و يجب فحص الحذاء من
الداخل باستمرار تفادياً لوجود أى شىء بداخله قد
يؤذى القدمين و القيام بخلع الحذاء بعد ٥ ساعات من
إرتدائه لتغيير نقاط الضغط على القدمين .

عدم المشى بقدمين حافيتين أبداً تجنباً لأيّة
إصابات محتملة .
يتم غمر القدمين بالماء الدافئ قبل قص الأظافر
و قصها مستقيمة .

Insulin

المستحضرات المحتوية على هرمون الانسولين **Insulin**

Insulin indicated in ttt of diabetes mellitus
☞ Crystalline Insulin used in ttt of diabetic coma
due to ketoacidosis through i.v. route .
otherwise this indication all types of insulin
given subcutaneously S.C.

Early Symptoms of Diabetes Thirst –
Excessive urination & in turn Drinking water -
weight loss . delay of therapy ☞ following
Complications Ketoacidosis – Retinopathy –
Atherosclerosis & Joints inflammations .

الانسولين **Crystalline (Regular Insulin)** المائي قصير المفعول

N.B. preparations named also soluble Insulin,
they have-not prolonged duration of action.

Humulin-R 100	10 ml. Vial	Lil ly	Neutral Insulin100 i.u./ml.
Insulin Neutral 20	10ml Vials	N ov o	1ml. contains 20 i.u.
Actrapid Human 100	10ml. Vial	N ov o	100 i.u./ml.
Actrapid Human Penfill 100	5 Penfills	N ov o	Human Neutral Insulin 100 i.u./ml.

Endocrine disorders

Mixed Human Insulin Suspension (Crystalline 30% + ProtamineInsulin 70%)

المستحضرات المحتوية على انسولين مختلط (قصير+طويل
المفعول)

Humulin 30/70 Cartridge 100	5 Vials 3ml.	Lilly	100 i.u./ml.
Humulin-N 100	10 ml. Vial	Lilly	100 i.u./ml.
Humulin 30/70 100	10ml Vial	Lilly	100 i.u./ml.
Insulatard Novolet 30/70	5Vials 3ml.	Novo	100 I.U/ml
Insulatard NPH 30/70	10ml.V ial	Novo	
Insulatard Penfill NPH	5Vials	Novo	
Insulin-Mix 40 i.u.	10 ml.Vial	Vacsera	40 i.u./ml.
Insulin-Mix 100 i.u.	10 ml.Vial	Vacsera	100 i.u./ml.
Insulin 40 H.Mix	10ml vial	Sedic o	40 i.u./ml.
Insulin 40 H.Bio	10ml vial		40 i.u./ml.
Insulin 40 NPH	10ml vial		40 i.u./ml.
Insulin 100	10ml vial		n100 i.u./ml
Insulin 100	10ml vial		100 i.u./ml
Insulin 100	10ml vial		100 i.u./ml
Lantus 100 IU.	3ml. Cartrid ge	Aventis	Insulin glargine 100i.u.
Lantus 100 IU.	3ml. X 5 Cartrid ge	Aventis	
Mixtard 100	10 ml.Vial	Novo	Human Insulin 100
Mixtard 40	10 ml.Vial	Novo	40 i.u./ml.
NovoMix 30 Flexpen	5 ready to use pen X	Novo Nordisk	Biphasic insulin aspart 30/70
NovoMix 30 Penfill	3ml.		

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Oral Hypoglycemic Drugs

These drugs are used in non Insulin dependent diabetes which named Adult-onset diabetes, in those patients the endogenous Insulin is depressed, in this type of diabetes diet modification is considered a treatment .

Sulphonylurea Group

مجموعة السلفونيل يوريا لعلاج مرضى السكر

Glibenclamide منشط لافراز الانسولين -
لعلاج مرضى السكر

Dose acc. To blood glucose level - $\frac{1}{2}$ tab. /12 hours – increased gradually tell reach normal blood level – maximum 3 tab. Daiy.

Daonil 5	20 tab.	Aventis	5mg.
Diaben 5	20 tab.	Pharco	5mg.
Euglucon 5	30 tab.	Roche	5mg.
Euglumide 5	30 tab.	ChemiPh arm	5 mg.
Glibenase 5	20 tab.	Adco	5mg.
Semi-Daonil 2.5	20 tab.	Aventis	2.5mg.

Glibenclamide + Metformin

منشط لهرمون الانسولين + منشط لحرق الجلوكوز بواسطة الانسجة

Glimet	20 tab.	ChemiPharm /Marcryl	2.5mg+Metformin 400mg.
Glucovance	30 tab.	MinaPharm/ Merck	5mg.+ Metformin 500mg.
Metclamide	30 tabs.	EPCI	2.5mg+Metformin 500 mg.
Metclamide		EPCI	5mg.+

Endocrine disorders

Metformin 500mg.

Gliclazide منشط لافراز هرمون الانسولين -
لعلاج مرضى السكر

In addition to the antidiabetic effect of Gliclazide it reduces platlets aggregability and prevent clots formation.

Dose 80-240mg. Daily on divided doses – according To patient blood-glucose level

Diabetron 40	20 tab.	Amoun	40mg.
Diabetron 80	20 tab	Amoun	80mg.
Diabyl 80	20 tab.b.	Memphis	80mg.
Diamicron 80	20 tab.	Servier	80mg.
Diamicron MR 30	30 modified release tab.	Servier	30mg
Diamicron MR 60	20 modified release tab.	Servier	60mg
Dianormal 80	20 tab.	Rameda	80mg.
Glipicrone 80	20 tab.	Amriya	80mg.
Semi Glipicron	20 tab.	Amriya	40mg.
Serviclazide 80	10 tab.	Novartis /Sandoz	80mg.
Unocron MR 30	30 tab.	UniPharm a /EgyPhar	30mg.

Glimepiride منشط لافراز هرمون الانسولين -
لعلاج مرضى السكر

Mechanism 3rd. generations

Sulphonylurea class. It lowers blood glucose levels by stimulating the release of insulin from functioning pancreatic beta cells and also by increasing the sensitivity of peripheral tissues to insulin.

Indications Non-Insulin Dependent Diabetes Mellitus (NIDDM) not responding to diet & exercise alone.

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2- In combination with insulin in patients whose glucose levels cannot be controlled .

Dose 1-2 mg once daily.

Maintenance dose: 1-4 mg once

Amaryl 1	10 tab.	Aventis	1mg.
Amaryl 2	10 tab.	Aventis	2mg.
Amaryl 3	10 tab.	Aventis	3mg.
Diabeto 2	10 tab.	HiPharm	2mg.
Diabenor 2	10 tab	Pharonia /EGD	2 mg.
Diabenor 3	10 Tab	Pharonia /EGD	3 mg.
Diabride 1	10 tab.	Sedico	1mg.
Dolcyl 1	10 tab.	Mup	1mg.
Dolcyl 2	10 tab.	Mup	2mg.
Dolcyl 3	10 tab.	Mup	3mg.
Glimadel 1	10 tab.	DeltaPharm	1mg.
Glimadel 2	10 tab.	DeltaPharm	2mg.
Glimadel 3	10 tab.	DeltaPharm	3mg.
Glimaryl 1	10 Tab	T3A	1 mg
Glimaryl 2	10 Tab	T3A	2 mg
Glimaryl 3	10 Tab	T3A	3 mg

Pamidine 250	20 tab.	0.75	Kahira	Chlorpropamide 250mg.
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Glipizide منشط لافراز هرمون الانسولين - لعلاج مرضى السكر

Minidiab 5	30 tab.	Cid/Pharmacia	Glipizide 5mg.
Glupizide 5	30 tab.	Pharaonia	5mg.
Glipizide 5	20 tab.	Pharco	5mg.

Acarbose - يخفض الجلوكوز في الدم (لعلاج مرضى السكر)

Mechanism Competitive inhibitor of intestinal alpha-glucosidases with maximum specific inhibitory action against sucrose - so prevent

Endocrine disorders

carbohydrate breakdown to glucose so not absorbed to the blood **Dose** 100-400mg. Daily

Glucobay 50	30 tab.	Cid /Bayer	50mg.
Glucobay 100	30 tab.	Cid /Bayer	100mg.

Pioglitazone بيوجليتازون - منشط لحرق الجلوكوز بواسطة الانسجة

Pioglitazone belong to the new group which named Thiazolidinediones that increase tissue sensitivity to insulin so this group called " insulin sensitizers"

Dose 15:45 mg. once daily, can be combined with sulphonyl urea group or metformin

Actozone	10 tab.	Amoun	Pioglitazone 30mg.
Diabetin 15	10 tab.	Uni Pharma	Pioglitazone 15mg.
Diabetin 30	10 tab.		Pioglitazone 30mg.
Ensudyne 15	7 tab.	Mup	Pioglitazone 15mg.
Ensudyne 30	7 tab.	Mup	Pioglitazone 30mg.
Pro Glustin 15	7 tab.	Lilly	Pioglitazone 15mg.
Glustin 30	7 tab.	Lilly	Pioglitazone 30mg.
Hi Glitazone 15	10 tab.	Hi Pharm	Pioglitazone 15mg.
Hi Glitazone 30		Hi Pharm	Pioglitazone 30mg.
PioJet 30	10 tab.	EEP H.Co.	Pioglitazone 30mg.

Rosiglitazone maleate منشط لحرق الجلوكوز بواسطة الانسجة

Improve cell sensitivity to insulin for consumption & burning of glucose. Can be given with or without food.

C/I : patient with heart failure.- safety in pregnancy is unproven.

Dose : 4 mg. once daily - maximum daily dose is 8 mg. daily .

Avandia 4	14 tab.	Gsk	4mg.
Diazan	10 tab.	OctoberP	4mg.

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		harma /Apex	
Rosilone	20 tab.	OctoberP harma /Apex	4mg.
Rosizone 4	10 tab.	OctoberP harma /Apex	4mg.
Rosidexx 4	10 f.c.tab.	IDI/Sig ma	4mg.
Rosidexx 8	10 f.c.tab.	IDI/Sig ma	8mg.

Nateglinide ناتيجلينيد - مخفض لجلوكوز
بالدم

Starlix Combi	24 tab.+ 24tab	Nova rtis	24 tab. Nateglinide 120mg.+ 24 tab. Metformin 500mg.
Starlix 120	24 tab.	Nova rtis	Nateglinide 120mg.

Repaglinide منشط لافراز هرمون
الانسولين - يعطى بعد كل وجبة

Mechanism short-acting meglitinide
⇒ stimulate the pancreas for insulin
production – it taken directly after
each meal .

Diarol 0.5	20 tab.	Amoun	0.5mg.
Diarol 1	20 tab.	Amoun	1 mg.
Diarol 2	20 tab.	Amoun	2 mg.
Novonorm 0.5	30 tab.	NovoNordisk	0.5mg.
Novonorm 1	30 tab.	NovoNordisk	1 mg.
Novonorm 2	30 tab.	NovoNordisk	2 mg.
Repaglide 0.5	20 tab.	MultiPharma	0.5mg.
Repaglide 1	20 tab.	MultiPharma	1 mg.
Repaglinide 1	30 tab.	Eipico	1 mg.

Other Preparations used for ttt of Diabetics

ادوية اخرى لتخفيض جلوكوز الدم - علاج

مرضى السكر

Diamol 500	20 tab	ADWIC	Tolbutami de 500m g.
Glurenor 30	20 tab.	Menarini/ MinaPhar m	Gliquidone 30mg.
Diavance 2.5	30 tab.	Sigma	Glyburide 2.5mg.+ Metformin hcl 500mg.
Diavance 5	30 tab.	Sigma	Glyburide 5mg.+ Metformin hcl 500mg.

Biguanide Group

Metformin ميتفورمين - مخفض لجلوكوز
الدم

Mechanism decrease Glucose
production from liver & increase
consumption of glucose by tissues
Metformin is suitable for over weight
diabetics , and sulphonylurea resistan
diabetics. Also can be combined with
Insulin.

Dose : 500 , 850 or 1000mg. once or
twice daily

Amophage 500	10 tab.	Amoun	500m g.
Cidophage 500	10 tab.	Cid	500m g.
Cidophage Retard 850	30 tab.	Cid	850m g.
Cidophage Retard 850	60 tab.	Cid	850m g.
Diaformin 500	20 tab.	Pharco	500m g.
Diaphage 500	20 tab.	Pharaonia	500m g.
Diaphage 850	30 tab.	Pharaonia	850m g.
Glucoformin 500	20 tab.	Novartis	500m g.
Glucophage 500	50 tab.	MinaPh	500
500		am /Merck	mg.

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Glucophage 1000	30 tab.	MinaPharm /Merck	1000 mg.
Metformin 500	10 tab.	ADWIC	500mg.

Diabetes Insipidus

Despite the name, diabetes insipidus is not related to type 1 or type 2 diabetes. People with diabetes insipidus are thirsty all the time and have to urinate very often. They might wake up 2 or 3 times in the night to urinate.

Causes :

Two things cause diabetes insipidus:-

- A part of the brain (called the hypothalamus) doesn't make enough antidiuretic hormone (called ADH). ADH helps body balance water in the urine and blood.
- the kidneys don't work with this hormone the way they should (nephrogenic diabetes insipidus).

Most people with diabetes insipidus get it after an injury to the head or after brain surgery. Some people with diabetes insipidus have a brain tumor. Sometimes it runs in families. Some medicines, like lithium, can also cause it. About 25% of the time, doctors can't find the cause.

Endocrine disorders

Diagnosis :

- A "water deprivation" test. During this test, Patient is not allowed to drink any liquids. The staff will weigh patient, check her urine and blood every hour for several hours. If the results of the test show that he has diabetes insipidus, he will probably also has pictures taken of her brain with a CT (computed tomographic) scan or an MRI (magnetic resonance image). The scans can show problems in the brain.

Treatment :

- Adequate fluid intake to avoid dehydration .
- Psychotherapy .

One medicine called desmopressin (brand name: Minirin Or DDAVP) can help and it's like body's natural ADH. This medicine comes as nasal spray and other forms. If patient takes Minirin, he shouldn't drink too much, or his body will get overloaded with fluids. Too much fluid in his body and make him feel sick, weak or dizzy.

R / Minirin nasal Spray .

يستشق ١٠ ميكروجرام بأحد الأنف مرة واحدة أثناء النهار و أخرى كل مساء

Or : Minirin 0.1 or 0.2 mg tab .

قرص مرتين يوميا

Or : Vasopressin Amp.

٥,٢-٥ وحدات (٥سم مكعب) بالعضل يوميا أو يوم بعد يوم

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If diabetes insipidus is caused by kidneys (nephrogenic diabetes insipidus) that don't work well with ADH, then DDAVP won't help. Other medicines, like hydrochlorothiazide (a "water" pill), may help. Water pills help body balance salt and water.

R / Tegratol 200 mg tab.

نصف - ١ قرص مرتين إلى ٣ مرات يوميا

It stimulates release of vasopressin & may lead to haematological side effects .

Hypoglycemia

Hypoglycemia is a condition characterized by an abnormally low level of blood sugar (glucose), the body's main energy source.

Hypoglycemia is commonly associated with diabetes. However, a wide variety of conditions, many of them rare, can cause low blood sugar in people without diabetes. Like fever, hypoglycemia isn't a disease itself, it's an indicator of a health problem.

In people who don't have diabetes, some underlying causes of hypoglycemia include: certain medications; alcohol; certain cancers; critical illnesses such as kidney, liver or heart failure; hormonal deficiencies; and disorders that result in the body producing too much insulin.

Signs and symptoms

The brain needs a steady supply of glucose, for it neither stores nor manufactures its own energy supply.

Endocrine disorders

Hypoglycemia can have these effects on the brain:

- Confusion, abnormal behavior or both, such as the inability to complete routine tasks
- Visual disturbances, such as double vision and blurred vision
- Seizures, uncommonly
- Loss of consciousness, uncommonly

Hypoglycemia may also cause these other signs and symptoms:

- Heart palpitations
- Tremor
- Anxiety
- Sweating
- Hunger

These signs and symptoms aren't specific to hypoglycemia. There may be other causes. The only way to know for sure that hypoglycemia is the cause is by measuring blood sugar level.

In someone without diabetes, the normal range for a fasting blood sugar level is between 70 and 100 milligrams per deciliter (mg/dL). A low fasting blood sugar for someone without diabetes is defined as a level below 50 mg/dL.

Causes

The list of possible specific causes of hypoglycemia in people without diabetes is lengthy. Causes include the following:

- Mistaken use. Taking someone else's oral diabetes

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medication accidentally is a common cause of hypoglycemia.

- Some medications. may cause hypoglycemia, especially in children or in people with kidney failure. e.g. quinine, which is used to treat leg cramps and malaria.
- Alcohol. Excessive alcohol consumption can block the process of glucose production, depleting body's stores of glycogen. This usually only occurs when eating and drinking heavily.
- Some critical illnesses. Severe illnesses of the liver, such as drug-induced hepatitis, can cause hypoglycemia because liver is a key organ in glucose production. The kidney also is an important organ in glucose production, and conditions such as kidney failure affect glucose levels. Long-term starvation, as may occur in the eating disorder anorexia nervosa, can result in the depletion of substances the body needs in gluconeogenesis, causing hypoglycemia.
- Excessive production of insulin: may be caused by a rare disorder of the beta cells in pancreas, e.g a beta cell tumor (insulinoma) .
- Endocrine deficiencies. Certain disorders of the adrenal glands (Addison's disease) and the pituitary gland (hypopituitarism) can result in a

Endocrine disorders

*deficiency of key hormones that regulate glucose production.

- Other tumors (non-beta-cell tumors). Hypoglycemia may result from tumors other than a beta cell tumor of the pancreas. Some tumors don't cause an overproduction of insulin, but cause excessive utilization of glucose by the tumor or they result in an overproduction of insulin-like substances. Elevated levels of these substances cause hypoglycemia.

Most hypoglycemia occurs in a fasting state, but that's not always the case. Sometimes, hypoglycemia occurs after meals because the body produces more insulin than is needed. This type of hypoglycemia is called reactive or postprandial hypoglycemia.

Screening and Diagnosis

- Documentation of low blood glucose when the signs and symptoms occur. a sample of blood will be drawn to be analyzed in the laboratory.
- Disappearance of the signs and symptoms. The second part of the diagnostic triad involves whether signs and symptoms go away when blood glucose levels are raised.

Treatment

Treatment of the underlying condition that's causing

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hypoglycemia, to prevent it from recurring .

R / Oral glucose (If the patient is conscious & co-operative to swallow)

Or : Dextrose 5 % solution (If the patient is unable to swallow)

٥٠ سم مكعب بالوريد تكرر عند الحاجة

Or : Glucagon injection .

١ مجم بالعضل

+ In prolonged hypoglycemia :

R / Fortecortin 8 mg Amp.

Or : Decadron 8 mg amp.

حقنة بالوريد

Addison's disease

Addison's disease is a disorder that results in the body producing insufficient amounts of certain hormones produced by adrenal glands.

Adrenal glands are located just above each of the two kidneys. These glands are part of the endocrine system, and they produce hormones that give instructions to virtually every organ and tissue in the body.

In Addison's disease, the adrenal glands produce too little cortisol, which is one of the hormones in a group called the glucocorticoids. Sometimes, Addison's disease also involves insufficient production of aldosterone, one of the mineralocorticoid hormones. Addison's disease can be life-threatening.

Also called adrenal insufficiency or hypocortisolism, Addison's disease can occur at any age, but is most

Endocrine disorders

common in people ages 30 to 50.

Treatment for Addison's disease involves taking hormones to replace the insufficient amounts being made by the adrenal glands.

Signs and symptoms

- Muscle weakness and fatigue
- Weight loss and decreased appetite
- Darkening of skin (hyperpigmentation)
- Low blood pressure, even fainting
- Salt craving
- Low blood sugar (hypoglycemia)
- Nausea, diarrhea or vomiting
- Irritability
- Depression

Sometimes, however, the signs and symptoms of Addison's disease may appear suddenly. In acute adrenal failure (addisonian crisis), the signs and symptoms may also include:

- Pain in lower back, abdomen or legs
- Severe vomiting and diarrhea, leading to dehydration
- Low blood pressure
- Loss of consciousness

Causes

The adrenal glands are composed of two sections :-

1- The interior (medulla) produces adrenaline-like hormones.

2- The outer layer (cortex) produces a group of hormones called corticosteroids, which include

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glucocorticoids, mineralocorticoids and male sex hormones (androgens).

Some of the hormones the cortex produces are essential for life — the glucocorticoids and the mineralocorticoids.

- **Glucocorticoids.** These hormones influence body's ability to convert food fuels into energy, play a role in immune system's inflammatory response, and help the body respond to stress.
- **Mineralocorticoids.** These hormones maintain body's balance of sodium and potassium and water to keep blood pressure normal.

Primary adrenal insufficiency
Addison's disease occurs when the cortex is damaged and doesn't produce its hormones in adequate quantities. Doctors refer to the condition involving damage to the adrenal glands as primary adrenal insufficiency.

The failure of adrenal glands to produce adrenocortical hormones is most commonly the result of the body attacking itself (autoimmune disease). For unknown reasons, immune system views the adrenal cortex as foreign something to attack and destroy.

Other causes of adrenal gland failure may include:

- Tuberculosis

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- Other infections of the adrenal glands
- Spread of cancer to the adrenal glands
- Bleeding into the adrenal glands

Secondary adrenal insufficiency
Adrenal insufficiency can also occur if pituitary gland is diseased. The pituitary gland makes a hormone called adrenocorticotrophic hormone (ACTH), which stimulates the adrenal cortex to produce its hormones. Inadequate production of ACTH can lead to insufficient production of hormones normally produced by adrenal glands, even though adrenal glands aren't damaged. Doctors call this condition secondary adrenal insufficiency.

Another more common possible cause of secondary adrenal insufficiency occurs when people who take corticosteroids for Treatment of chronic conditions, such as asthma or arthritis, abruptly stop taking the corticosteroids.

Addisonian crisis

If patient has untreated Addison's disease, an Addisonian crisis may be provoked by physical stress, such as an injury, infection or illness.

Screening and Diagnosis

- **Blood test.** Measuring blood levels of sodium, potassium, cortisol and ACTH. A blood test can also measure antibodies associated with autoimmune Addison's disease.

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- ACTH stimulation test. This test involves measuring the level of cortisol in blood before and after an injection of synthetic ACTH. ACTH signals adrenal glands to produce cortisol. If adrenal glands are damaged, the ACTH stimulation test shows that output of cortisol in response to synthetic ACTH is blunted or nonexistent.
- Insulin-induced hypoglycemia test. Occasionally, doctors suggest this test if pituitary disease is a possible cause of adrenal insufficiency (secondary adrenal insufficiency). The test involves checking blood sugar (blood glucose) and cortisol levels at various intervals after an injection of insulin. In healthy people, glucose levels fall and cortisol levels increase.
- Imaging tests. a computerized tomography (CT) scan of abdomen to check the size of adrenal glands and looking for other abnormalities that may give insight to the cause of the adrenal insufficiency. a CT scan or magnetic resonance imaging scan of pituitary gland may be suggested if testing indicates patient has secondary adrenal insufficiency.

Management of Addisonian crisis

An addisonian crisis is a life-threatening situation that results in low blood pressure, low blood levels of sugar and high blood levels of

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potassium. This situation requires immediate medical care. Treatment typically includes intravenous injections of:

- Hydrocortisone
- Saline solution
- Sugar (dextrose)

R / Dextrose 5 % in normal saline solution . First given fairly rapidly .

R / Solu-cortef (hydrocortisone)
100 mg. ٢٠٠ مجم حقن بالوريد ثم ١٠٠
مجم في محلول الجلوكوز بالتقطيع كل ٨ ساعات

R/ Astonin-H tab.

٢-١ قرص كل ٦ ساعات

- Treatment of precipitating factors e.g. infection .
- Complete bed rest .
- Monitoring of hypotension & hypoglycemia .

Cushing's syndrome (Hypercortisolism)

Definition

Cushing's syndrome is a disease caused by increased production of cortisol, or by excessive use of cortisol or other steroid hormones.

Causes, incidence, and risk factors

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Cushing's syndrome is a condition that results from an excess of cortisol, a hormone produced by the adrenal glands. The most common cause of Cushing's syndrome is Cushing's disease, caused by excessive production of the hormone ACTH by the pituitary gland. ACTH stimulates the adrenal glands to produce cortisol.

Cushing's syndrome can be caused by a tumor of the pituitary gland, a tumor of the adrenal gland, a tumor somewhere other than the pituitary or adrenal glands (ectopic Cushing's syndrome), or by long-term use of corticosteroids (drugs commonly used to treat conditions such as rheumatoid arthritis and asthma).

Risk factors for Cushing's syndrome are adrenal or pituitary tumors, long-term therapy with corticosteroids, and being female.

Symptoms

- Moon face (round, red, and full)
- Buffalo hump (a collection of fat between the shoulders)
- Central obesity with protruding abdomen and thin extremities .
- Weight gain (unintentional)
- Weakness
- Backache
- Headache
- Acne or superficial skin infections
- Thin skin with easy bruising
- Thirst
- Increased urination

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- Purple striations on the skin of the abdomen, thighs, and breasts
- Mental changes
- Impotence or cessation of menses
- Facial hair growth

Additional symptoms that may be associated with this disease:

- Skin spots, red
- Skin blushing / flushing
- Muscle atrophy
- Fatigue
- Bone pain or tenderness
- High blood pressure
- Low S. Potassium & Chloride .

Signs and tests

Tests to confirm high cortisol level:

- Cortisol, urine
- Dexamethasone suppression test (Failure of suppression of cortisol secretion by exogenous dexamethasone) .
- Serial serum cortisol levels

Tests to determine the cause:

- ACTH
- Cranial MRI or cranial CT scan may show pituitary tumor
- Abdominal CT may show adrenal mass

General findings:

- Glucose test is elevated
- Potassium test may be low

- White blood cell count may be elevated

Treatment

R / Potassium Syrup.

Or : Slow K tab.

قرص أو ملعقة ٣ مرات يوميا

Notes :

Treatment depends upon the cause of the disorder.

- In Cushing's syndrome caused by drug therapy with corticosteroids, the drug dose must be slowly decreased under medical supervision.

- In Cushing's disease caused by a pituitary tumor, surgery to remove the tumor is recommended. Radiation is sometimes needed as well.

Hydrocortisone (cortisol) replacement therapy is needed after surgery. In some cases, life-long cortisol-replacement therapy becomes necessary.

- Cushing's syndrome caused by an adrenal tumor is usually treated by surgical removal of the tumor. If the tumor cannot be removed, certain medications can suppress the secretion of cortisol.

- In Cushing's syndrome caused by a tumor secreting ACTH, removal of the tumor is the best way to treat the Cushing's syndrome. Cortisol replacement therapy is needed after surgery until cortisol production resumes. In some cases, life-long therapy with cortisone drugs becomes necessary.

Goiter

Definition A goiter is an enlargement of the thyroid gland. It is not cancer.

Causes, incidence, and risk factors

There are different kinds of goiters. A simple goiter usually occurs when the thyroid gland is not able to produce enough thyroid hormone to meet the body's needs. The thyroid gland makes up for this lack by enlarging, which usually overcomes mild deficiencies of thyroid hormone.

A simple goiter may be classified as either an endemic (colloid) goiter or a sporadic (nontoxic) goiter.

Endemic goiters occur within groups of people living in geographical areas with iodine-depleted soil, usually regions away from the sea coast **ساحل البحر**. People in these communities might not get enough iodine in their diet (iodine is vital to the formation of thyroid hormone). The modern use of iodized table salt in the U.S. prevents this deficiency. However, inadequate iodine is still common in central Asia and central Africa.

In most cases of sporadic goiter the cause is unknown. Occasionally, certain medications such as lithium or aminoglutethimide can cause a nontoxic goiter.

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Hereditary factors may cause goiters. Risk factors for the development of a goiter include female sex, age over 40 years, inadequate dietary intake of iodine, residence in an endemic area, and a family history of goiter.

Symptoms

- Thyroid enlargement varying from a single small nodule to massive enlargement (neck lump)
- Breathing difficulties, cough, or wheezing due to compression of the windpipe
- Swallowing difficulties due to compression of the esophagus
- Neck vein distention and dizziness when the arms are raised above the head

Signs and tests

- Measurement of thyroid stimulating hormone (TSH) and free thyroxine (T4) in the blood
- Thyroid scan and uptake
- Ultrasound of thyroid -- if nodules are present, a biopsy should be done to check for thyroid cancer

Treatment

R / Eltroxin 50 mcg tab. ٢-١ قرص
قبل الإفطار يوميا و يمكن زيادتها إلى ٦-٣ أقراص
حسب الحالة و يستمر العلاج لمدة ٦ أشهر

A goiter only needs to be treated if it is causing symptoms. The enlarged thyroid can be treated with

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radioactive iodine to shrink the gland or with surgical removal of part or all of the gland (thyroidectomy).

- Small doses of iodine (Lugol's or potassium iodine solution) may help when the goiter is due to iodine deficiency.

R / Lugol's iodine solution .

ه نقط على نصف كوب ماء يوميا حتى تعود الغدة
إلى حجمها الطبيعي ثم ينصح باستخدام ملح غنى
بالأيود

Pituitary dwarfism (Panhypopituitarism)

Definition Pituitary dwarfism or may called Growth hormone deficiency involves abnormally short stature قصير القامة with normal body proportions. Growth hormone deficiency can be categorized as either congenital (present at birth) or acquired.

Causes, incidence, and risk factors

An abnormally short height in childhood may occur if the pituitary gland does not produce enough growth hormone. It can be caused by a variety of genetic mutations (such as Pit-1 gene, Prop-1 gene, growth hormone receptor gene, growth hormone gene), absence of the pituitary gland, or severe brain injury, but in most cases no underlying cause of the deficiency is found.

Growth retardation may become evident in infancy and persist throughout childhood. The child's

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"growth curve," which is usually plotted on a standardized growth chart by the pediatrician, may range from flat (no growth) to very shallow (minimal growth). Normal puberty may or may not occur, depending on the degree to which the pituitary can produce adequate hormone levels other than growth hormone.

Growth hormone deficiency may be associated with deficiencies of other hormones, including the following:

- Thyrotropins (control production of thyroid hormones)
- Vasopressin (controls water balance in the body)
- Gonadotropins (control production of male and female sex hormones)
- ACTH or adrenocorticotrophic hormone (controls the adrenal gland and its production of cortisol, DHEA, and other hormones)

Physical defects of the face and skull can also be associated with abnormalities of the pituitary or pituitary function. A small percentage of infants with cleft lip and cleft palate have decreased growth hormone levels.

Symptoms

- Slowed or absent increase in height
- Slow growth before age 5
- Short stature -- below 5th percentile on a standardized growth chart, an adult less than 5 feet tall

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- Absent or delayed sexual development in an adolescent
- Headaches
- Excessive thirst with excessive urination
- Increased urine volume

Signs and tests

A physical examination including weight, height, and body proportions will show signs of slowed growth rate and deviation from normal growth curves.

Tests may include the following:

- Hand x-ray can determine bone age.
- DEXA (Dual Energy X-ray Absorptiometry) can also determine bone age.
- Measurement of growth hormone and associated binding protein levels (IGF-I and IGFBP-3) reveals if the growth problem is caused by dysfunction of the pituitary gland.
- Tests to measure other hormone levels (lack of growth hormone may not be an isolated problem).
- X-ray of head may show problems with the skull, such as small, enlarged, or empty sella or a space-occupying lesion.
- MRI of the head can show the hypothalamus and pituitary glands.

Treatment

R / Genotropin (somatropin) vial .
وحدة / كجم / اسبوعيا 5,0 - 7,0

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- Treatment should be continued for several years until closure of epiphyses occurs .

Acromegaly & Gigantism

Acromegaly is an uncommon hormonal disorder that develops when pituitary gland produces too much growth hormone during adulthood. When this happens, bones increase in size, including those of hands, feet and face. The term "acromegaly" is derived from the Greek words for extremities and enlargement. Acromegaly usually affects middle-aged adults.

In children who are still growing, too much growth hormone can cause a condition called gigantism. These children have exaggerated bone growth and an abnormal increase in height.



Signs and symptoms

One of the most common signs of acromegaly is enlarged hands and feet , gradual changes in the shape of face, such as a protruding lower jaw and brow, an enlarged nose, thickened lips, and wider spacing between teeth.

In addition to enlarged hands and feet and facial changes, acromegaly may also produce the following signs and symptoms, which can vary from one person to another:

- Coarse, oily, thickened skin

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- Excessive sweating and body odor
- Small outgrowths of skin tissue (skin tags)
- Fatigue and muscle weakness
- A deepened, husky voice due to enlarged vocal cords and sinuses
- Severe snoring due to obstruction of the upper airway
- Impaired vision
- Headaches
- Enlarged tongue
- Pain and limited joint mobility
- Menstrual cycle irregularities in women
- Erectile dysfunction in men
- Enlarged liver, heart, kidneys, spleen and other organs
- Increased chest size (barrel chest)

Causes

The pituitary, a small gland located at the base of brain behind the bridge of nose, produces a number of hormones. One hormone, called growth hormone (GH), plays an important role in managing physical growth.

When GH is secreted into bloodstream, it triggers liver to produce a hormone called insulin-like growth factor-I (IGF-I). In turn, IGF-I stimulates the growth of bones and other tissues. If pituitary gland makes too much GH, excessive amounts of IGF-I can result. Too much IGF-I can cause abnormal growth of soft tissues and skeleton and other signs and symptoms characteristic of acromegaly and gigantism.

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In adults, a tumor is the most common cause of too much GH production:

Pituitary tumors. Most cases of acromegaly are caused by a noncancerous (benign) tumor (adenoma) of the pituitary gland. The tumor secretes excessive amounts of growth hormone causing many of the signs and symptoms of acromegaly. Some of the symptoms of acromegaly, such as headaches and impaired vision, are due to the tumor mass pressing on nearby brain tissues.

Nonpituitary tumors. In a few people with acromegaly, tumors in other parts of the body, such as the lungs, pancreas or adrenal glands, cause the disorder. Sometimes, these tumors actually secrete GH. In other cases, the tumors produce a hormone called growth hormone-releasing hormone (GH-RH), which stimulates the pituitary to make more GH.

Screening and Diagnosis

GH and IGF-I measurement. After fasting overnight, doctor will take a blood sample to measure levels of GH and IGF-I. Elevated levels of these hormones suggest acromegaly.

Growth hormone suppression test. This is the definitive method for verifying acromegaly. In this test, blood levels of GH are measured before and after drinking a

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preparation of glucose (sugar). Normally, glucose ingestion depresses levels of GH. If patient has acromegaly, his GH level will tend to stay high.

- **Imaging.** such as a computerized tomography (CT) scan or magnetic resonance imaging (MRI) scan — to help pinpoint the location and size of a tumor of pituitary gland. If radiologists, who usually perform the procedures, see no tumor of pituitary, they may look for nonpituitary tumors that might be responsible for high levels of GH.

Treatment

Treatment focuses on lowering production of GH, as well as reducing the negative effects of the tumor on the pituitary and surrounding tissues.

Surgery

Doctors can remove most pituitary tumors using a method called transsphenoidal surgery.

Removing the tumor can normalize GH production. In some cases, surgeon may not be able to remove the entire tumor. This may result in persistently elevated GH levels after surgery, requiring further medical or radiation Treatments.

Medications

Drugs used to lower the production or block the action of GH include:

- **Synthetic hormones.** The drug octreotide (Sandostatin, Sandostatin LAR) is a synthetic version of the brain hormone

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somatostatin. It can interfere with the excessive secretion of GH by the pituitary, and thus can produce rapid declines in GH levels. When starting octreotide Treatment, you initially inject patient with a short-acting preparation under skin (subcutaneously) three times a day to determine if he has any side effects from the medication and if it's effective. Then, if it's tolerated and effective, patient can takes a long-acting form that requires an injection into the muscles of buttocks (gluteal muscles), administered once a month.

- Dopamine agonists. they can lower levels of GH and IGF-I. The tumor may decrease in size in some people taking dopamine agonists or octreotide.

R / Parlodel (Bromocriptine) tab.

٢٠ - ٣٠ مجم في جرعات مقسمة

Or : Lactodel 2.5 mg tab.

Or : Dopagon 2.5 mg tab.

- Radiation
doctors may recommend radiation Treatment when tumor cells remain after surgery. Radiation therapy destroys any lingering tumor cells and reduces GH levels.

Thyroid Disease

Understanding the thyroid

The thyroid is a small gland, shaped like a butterfly, that rests in the

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middle of the lower neck. Its primary function is to control the body's metabolism (rate at which cells perform duties essential to living). To control metabolism, the thyroid produces hormones, T4 and T3, which tell the body's cells how much energy to use.

A properly functioning thyroid will maintain the right amount of hormones needed to keep the body's metabolism functioning at a satisfactory rate. As the hormones are used, the thyroid creates replacements. The quantity of thyroid hormones in the bloodstream is monitored and controlled by the pituitary gland. When the pituitary gland, which is located in the center of the skull below the brain, senses either a lack of thyroid hormones or a high level of thyroid hormones, it will adjust its own hormone (TSH) and send it to the thyroid to tell it what to do.

What is thyroid disease and whom does it affect?

When the thyroid produces too much hormone, the body uses energy faster than it should. This condition is called hyperthyroidism. When the thyroid doesn't produce enough hormone, the body uses energy slower than it should. This condition is called hypothyroidism.

Hypothyroidism (Myxedema)

Definition Hypothyroidism is a condition in which the thyroid gland fails to produce enough thyroid

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hormone.

Causes, incidence, and risk factors

The thyroid gland, located in the front of the neck just below the larynx, secretes hormones that control metabolism. These hormones are thyroxine (T4) and triiodothyronine (T3).

The secretion of T3 and T4 is controlled by the pituitary gland and the hypothalamus, which is part of the brain. Thyroid disorders may result not only from defects in the thyroid gland itself, but also from abnormalities of the pituitary or hypothalamus.

Hypothyroidism, or underactivity of the thyroid gland, may cause a variety of symptoms and may affect all body functions. The body's normal rate of functioning slows, causing mental and physical sluggishness. The symptoms may vary from mild to severe. The most severe form, called myxedema coma, is a medical emergency.

The following conditions cause hypothyroidism:

- Thyroiditis is an inflammation of the thyroid gland. This can lower the amount of hormones produced.
- Hashimoto's thyroiditis is a painless disease of the immune system that is hereditary.
- Postpartum thyroiditis occurs in 5 percent to 9 percent of

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women after giving birth. It is usually a temporary condition.

- Iodine deficiency Iodine is used by the thyroid to produce hormones. Iodine deficiency has been virtually wiped out by the use of iodized salt.
- A non-functioning thyroid gland affects one in 4,000 newborns. If the problem isn't corrected, the child will be physically and mentally retarded.

Symptoms

Early symptoms:

- 1- kness
- 2- Fatigue
- 3- Cold intolerance
- 4- Constipation
- 5- Weight gain (unintentional)
- 6- Depression
- 7- Joint or muscle pain
- 8- Thin, brittle fingernails
- 9- Thin and brittle hair
- 10- Paleness

Late symptoms:

- 1- w speech
- 2- Dry flaky skin
- 3- Thickening of the skin
- 4- Puffy face, hands and feet
- 5- Decreased taste and smell
- 6- Thinning of eyebrows
- 7- Hoarseness
- 8- Abnormal menstrual periods

Additional symptoms that may be associated with this disease:

- Overall swelling
- Muscle spasms (cramps)

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- Muscle pain
- Muscle atrophy
- Uncoordinated movement
- Absent menstruation
- Joint stiffness
- Dry hair
- Hair loss
- Drowsiness
- Appetite loss
- Ankle, feet, and leg swelling
- Short stature
- Separated sutures
- Delayed formation or absence of teeth

Signs and tests

A physical examination reveals delayed relaxation of muscles during tests of reflexes. Other findings may include pale, yellow skin, thin and brittle hair, coarse facial features, brittle nails, firm swelling of the arms and legs, and mental slowing. Vital signs may show slow heart rate, low blood pressure, and low temperature.

A chest x-ray may show an enlarged heart.

Laboratory tests to determine thyroid function include:

- T4 test (low)
- Serum TSH (high in primary hypothyroidism, low or low-normal in secondary hypothyroidism)

Additional laboratory abnormalities may include:

- Increased cholesterol levels
- Increased liver enzymes
- Increased serum prolactin
- Low serum sodium

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- A complete blood count (CBC) that shows anemia

Treatment

Hypothyroidism is treated with a drug called levothyroxine. This is a synthetic hormone tablet that replaces missing thyroid hormone in the body.

R / Eltroxin 50 mcg tab. ٢-١ قرص قبل الإفطار يوميا تزداد تدريجيا كل ٤ أسابيع

R / Thergran tab. قرص واحد يوميا

Myxedema Coma

Myxedema coma is a medical emergency that occurs when the body's level of thyroid hormones becomes extremely low. It is treated with intravenous thyroid hormones replacement and steroid therapy. Supportive therapy (oxygen, assisted ventilation, fluid replacement) and intensive-care nursing may be indicated.

Hyperthyroidism (Thyrotoxicosis)

Definition Hyperthyroidism is a condition caused by an overactive thyroid gland. The gland makes too much T4 and T3 hormones. Hormones are substances that affect and control many important functions in the body.

Causes, incidence, and risk factors

The thyroid gland is located in the neck. It produces several hormones which control the way that every cell

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in the body uses energy (metabolism). The thyroid is part of the endocrine system.

Hyperthyroidism or thyrotoxicosis occurs when the thyroid releases too many of its hormones over a short (acute) or long (chronic) period of time. Many diseases and conditions can cause this problem, including:

- Graves disease
- Non-cancerous growths of the thyroid gland or pituitary gland
- Tumors of the testes or ovaries
- Inflammation (irritation and swelling) of the thyroid due to viral infections or other causes
- Ingestion (taking in through the mouth, such as in eating) of large amounts of thyroid hormone
- Ingestion of excessive iodine

Graves disease accounts for 85% of all cases of hyperthyroidism.

Symptoms

- Weight loss
- Increased appetite
- Nervousness
- Restlessness
- Heat intolerance
- Increased sweating
- Fatigue
- Frequent bowel movements
- Menstrual irregularities in women
- Goiter (visibly enlarged thyroid) may be present

Additional symptoms that may be associated with this disease:

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- Weakness
- Sleeping difficulty
- Clammy skin
- Skin blushing or flushing
- Bounding pulse
- Nausea and vomiting
- Lack of menstruation
- Itching - overall
- Heartbeat sensations
- Hand tremor
- Hair loss
- Diarrhea
- Breast development in men
- High blood pressure
- Protruding eyes (exophthalmos)

Signs and tests

Physical examination may reveal thyroid enlargement or goiter. Vital signs (temperature, pulse, rate of breathing, blood pressure) show increased heart rate. Systolic blood pressure (the first number in a blood pressure reading) may be high.

Laboratory tests that evaluate thyroid function:

- Serum TSH is usually low
- T3 and free T4 are usually high

This disease may also alter the results of the following tests:

- Vitamin B-12
- TSI
- Triglycerides
- RT3U
- Radioactive iodine uptake
- Glucose test
- Cholesterol test
- Antithyroglobulin antibody

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Treatment Hyperthyroidism is usually treated with

- Antithyroid medications :

R / Neomercazol 5 mg tab.

Or : Carbimazol 5 mg tab.

٣ قرص بعد الأكل ٣ مرات يوميا حتى تختفي الأعراض (٣-٤ أسابيع) و بعد ذلك قرص ٣ مرات يوميا يوميا لمدة سنتين .

- Beta-blockers like propranolol are used to treat some of the symptoms including rapid heart rate, sweating, and anxiety until the hyperthyroidism can be controlled.

R / Indral (propranolol) 40 mg tab.

قرص قبل الأكل ٣ مرات يوميا

- Sedative :

R / Calmepam 1.5 or 3 mg tab.

قرص عند اللزوم

- Vitamin :

R / Becozyme amp.

Or : Viterra Cap.

أمبول بالعضل كل ٣ أيام أو كبسول مرتين يوميا

- Radioactive iodine (which destroys the thyroid and stops the excess production of hormones) is indicated in patients above 40 years .

- Subtotal thyroidectomy : Surgery to remove the thyroid. Is indicated in:

+ Retrosternal goitre .

+ Secondary thyrotoxicosis .

+ Failure or recurrence after medical treatment .

Endocrine disorders

N.B. If the thyroid must be removed with radiation or surgery, replacement thyroid hormones must be taken for the rest of the person's life.

Pre-operative preparation :

R / Neomercazol tab.

Or : carbimazole tab.

٢ قرص كل ٨ ساعات

R / Lugol's iodine solution .

١٠-٥ نقط على نصف كوب ماء يوميا

R / Calmepam 3 mg tab.

نصف - قرص ٣ مرات يوميا

- Treatment of Protruding eyes (exophthalmos) :

R / Eltroxin 50 mg tab.

قرص ٣ مرات يوميا

R / Deltacortril tab. ٤ قرصان بعد الأكل

مرات يوميا يوميا لمدة أسبوع ثم تخفض الجرعة تدريجيا بمعدل ١-٢ قرص كل أسبوع

Or : Synacthen -deopt amp.

حقنة بالعضل يوميا

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Genito-urinary pathologies

Renal colic

Treatment :

R / Voltaren Amp. حقنة بالعضل عند اللزوم

or : Buscopan Amp.

حقنة بالعضل أو الوريد ببطء عند اللزوم

Or : Glucolynamine amp.

حقنة بالوريد ببطء عند اللزوم

+ R / Rowatinex cap.

Or : Spasmopyralgin tab.

Or : Urinex cap.

كبسولة أو قرص ٣ مرات يوميا

OR / Spasmo-rowatinex Supp.

لبوسة كل ١٢ ساعة

+ R / uricol eff .

فوار على نصف كوب ماء ٣ مرات يوميا

N.B : Exclude other causes of colic

(e.g. appendicitis) must be done

first .

Urinary Stones (Calculi)

What is a kidney stone?

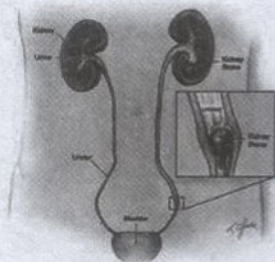
A kidney stone, or "urinary stone," develops when crystals from salt and mineral substances form in the urine. These crystals can combine and grow to form a stone.

The stones can range in size from a grain of salt to a golf ball, or even larger. Some stones may move to other parts of the urinary system, including the bladder and the ureter (the vessel that transports urine from the kidney to the bladder).

Symptoms

The most common symptoms of kidney stones are blood in the urine and pain. The

stone can cause pain once it passes into the ureter. Typically, the pain starts in the back by the rib cage and travels around to the side as the stone moves. It may also radiate (spread out) into the groin.



Other symptoms include:

- Feeling the need to urinate often
- Inability to urinate (because a stone is blocking the urinary tract)
- Nausea
- Vomiting

Rarely, a stone can cause an infection in the urine by blocking its flow. Cloudy, foul-smelling urine, fever, chills, or weakness

may be signs of a serious infection.

Diagnosis

A urinalysis (analysis of a small sample of urine for infection and blood) and a 24-hour urine collection (to look for substances associated with kidney stones) may also be performed. The urine is collected and strained, and any stones found in the urine are analyzed to determine their chemical composition.

Abdominal X-ray, ultrasound, intravenous pyelography (IVP), or computed tomography (CT) scan. In IVP, patient receives an injection of dye before the X-ray is taken. The dye is used to get a better image of the size and location of the kidney stone.

Treatment :

- شرب المياه بكثرة .
- الحد من تناول الكالسيوم و الأطعمة التي تحتوي على أملاح .

For pain & colic :

R / Buscopan amp.

حقنة بالعضل عن اللزوم

Or : Rowatinex Cap.

Or : Spasmopyralgin Tab.

Or : petro Tab.

Or : Urinex cap.

قرص أو كبسولة ٣ مرات يوميا

For expelling small stones :

R / Proximol Tab. قرص ٣ مرات يوميا

Or : Coli-urinal eff .

Or : urosolvine eff .

ملعقة أو كيس على نصف كوب ماء بعد الأكل

٣ مرات يوميا

R / Cystone tab. قرص ٢-٣ مرات

يومية يساعد على طرد الحصوات الصغيرة

Or : Khellalgine Amp.

أمبول بالوريد ببطء عند اللزوم

N.B. : Large size urinary stones removed surgically or via laser procedure .

The procedures for removing kidney stones include the following:

- Extracorporeal shock wave lithotripsy (ESWL) تفتيت الحصوة
ESWL (extracorporeal means "outside the body") is a procedure that uses shock waves to smash the kidney stone into tiny pieces that can pass from the body. It is usually used for smaller stones. In ESWL, the patient is placed in a large tub of water. The urologist locates the kidney stone with an X-ray or ultrasound. Shock waves are generated and travel through the water to the kidney area and crush the stone.
- Percutaneous nephrolithotomy
This is more of a surgical procedure and is intended for

larger kidney stones. The urologist makes an incision in the patient's back and inserts an instrument called a nephroscope into the kidney to remove the stone. In some cases, the urologist may need to use ultrasound to break a larger stone into smaller pieces. Following the procedure, the patient remains in the hospital for a few days.

- **Ureteroscopy**

This procedure is performed when the stone is located in the ureter. The urologist slips an instrument called a ureteroscope through the urethra (the tube through which the urine passes) into the bladder and up to the ureter. The urologist can then remove the stone with a device that resembles a cage or use ultrasound shock waves to pulverize the stone.

magnesium oxalate which passes easily with urine .

Cystitis

Signs and symptoms

- Most people with bladder infections develop signs and symptoms. These may include:
- A strong, persistent urge to urinate
- A burning sensation when urinating
- Passing frequent, small amounts of urine
- Blood in the urine (hematuria)
- Passing cloudy or strong-smelling urine
- A feeling of pressure in the lower abdomen
- Low-grade fever
- In young children, new episodes of bed-wetting (enuresis) may also be a sign of a UTI.

Oxalate stones

Treatment :

تجنب الأطعمة التي تحتوي على أملاح أو كسالات -
مثل الطماطم و الماتجو و الجوافة و غيرها

R/ Epimag Eff . sachets .

Or : Citrocid mag. Plus eff. Sachets .
كيس على نصف كوب ماء ٣ مرات يوميا

N.B. These eff . drugs contains magnesium citrate which react with the accumulated calcium oxalate insoluble salt forming the soluble salt

Complications

An untreated bladder infection can lead to potentially serious complications, such as a kidney infection (pyelonephritis), which could be associated with a bacterial bloodstream infection (bacteremia). Also, kidney infections may permanently damage kidneys. Young children and older adults are at the greatest risk of kidney damage due to bladder infections, because their symptoms are often overlooked or mistaken for other conditions.

Treatment

- شرب المياه بكثرة .

R / Ciprobay 500 , 750 mg
(Ciprofloxacin) tab.
Or : Tarivid 200mg. (ofloxacin)
Tab.
Or : Septrin Ds (Trimethoprim-
sulfamethoxazole) Tab.

قرص كل ١٢ ساعة لمدة ٥ أيام

R / Urinex Cap.
كبسولة ٣ مرات يوميا

عمل مزرعة للبول لمعرفة نوع المضاد -
الحيوى المناسب لقتل الميكروب .

Erectile dysfunction (Psychogenic impotence)

Signs and symptoms

Patterns of erectile dysfunction
include:

- Occasional inability to obtain a full erection
- Inability to maintain an erection throughout intercourse
- Complete inability to achieve an erection

Causes

The penis contains two cylindrical, sponge-like structures that run along its length, parallel to the tube that carries semen and urine (urethra). When a man becomes sexually aroused, nerve impulses cause the blood flow to the cylinders to increase about seven times the normal amount.

This sudden influx of blood expands the sponge-like structures and produces an erection by straightening and stiffening the penis. Continued sexual arousal or excitation maintains the higher rate of blood flow, keeping the erection firm. After ejaculation, or when the sexual excitation passes, the excess blood drains out of the spongy tissue, and the penis returns to its nonerect size and shape.

Specific steps take place to produce and sustain an erection:

- Arousal. The first step is sexual arousal, which men obtain from the senses of sight, touch, hearing and smell, and from thoughts.
- Nervous system response. The brain communicates the sexual excitation to the body's nervous system, which activates increased blood flow to the penis.
- Blood vessel response. A relaxing action occurs in the blood vessels that supply the penis, allowing more blood to flow into the shafts that produce the erection.

If something affects any of these factors or the delicate balance among them, erectile dysfunction can result.

Nonphysical causes

Nonphysical causes may account for impotence. They may include:

- Psychological problems. stress, anxiety and fatigue.